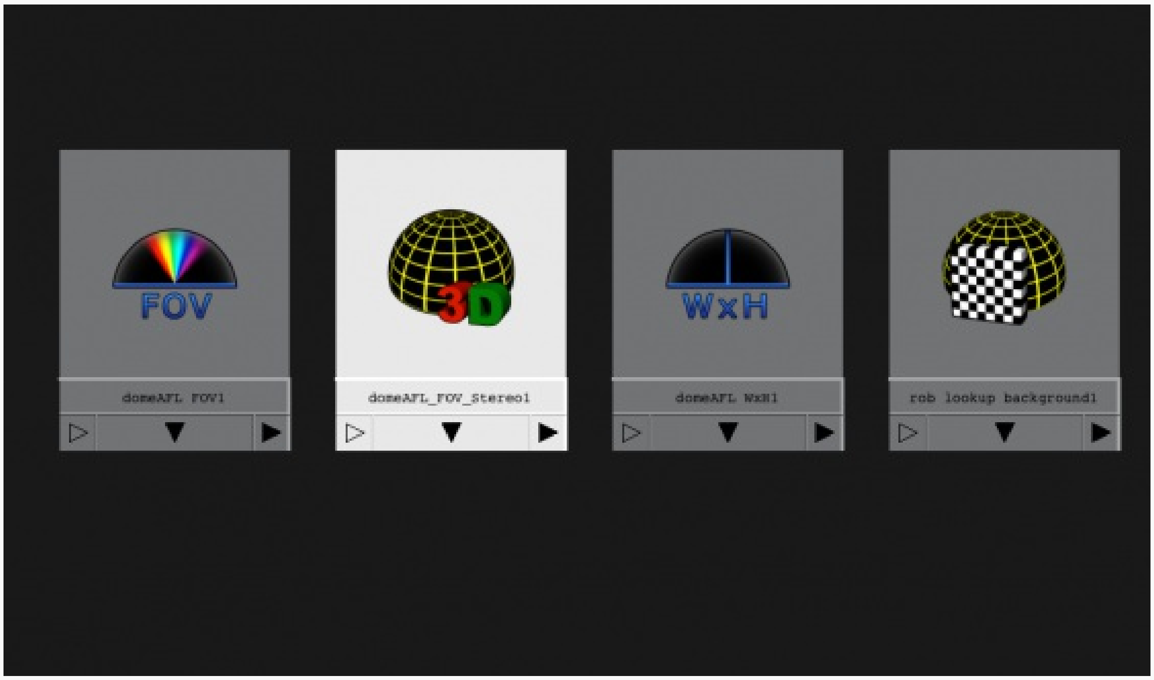
Getting Started with the Domemaster3D Shader

About This Shader

The Domemaster stereo shader is designed to create stereoscopic fulldome renderings for use in planetariums and other full dome theaters. Roberto Ziche created the domemaster stereo shader for 3D Studio Max and I have worked on adding Autodesk Maya and Softimage support.



There are four shaders that make up the Domemaster3D fulldome shader collection.

The Domemaster stereo shader is compiled for Maya / mental ray on Mac OS X 64-bit, Windows 32-bit and 64-bit, and Linux 64-bit systems.

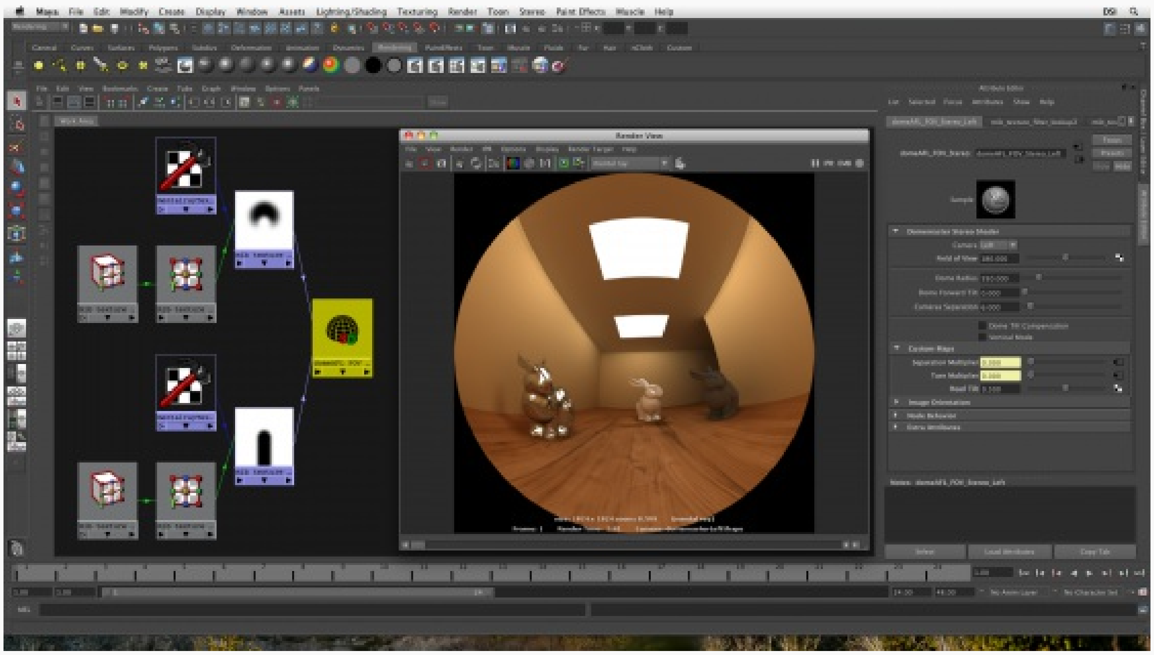
If you use Autodesk Softimage you should check out the Domemaster3D Shader for Softimage port.

You can also join the domemaster stereo discussion on the Fulldome NING group.

You can participate in the development on the Google Code page:

https://code.google.com/p/domemaster-stereo-shader/

This is a screenshot of the domeAFL_FOV_Stereo node in action:



Using the domemaster shader in Maya.

Download

You can download the latest version of the Domemaster3D shader for Maya & 3DSMax here:

[domemaster3D.zip]

Version History

Version 1.1
Released July 28, 2012
Added a Maya stereo camera rig example, Linux Build + Makefile, and new shader icons

Version 1.0
Released April 18, 2012
Initial version of the Domemaster3D shader for Maya

Installation Instructions

Maya on Windows

Step 1. Unzip the domemaster3D.zip archive.

Step 2. Copy the appropriate "domeAFL_FOV_Stereo.dll" file from either the "Windows 32-bit LIB" or "Windows 64-bit LIB" folder or to your mental ray LIB folder:

On Maya 2012:

> *C:\Program Files\Autodesk\Maya2012\mentalray\lib*

On Maya 2013:

> *C:\Program Files\Autodesk\Maya2013\mentalray\shaders*

If you are running a 32-bit version of Maya install the 32-bit DLL. If you are running a 64-bit version of Maya install the 64-bit DLL.

Step 3. Copy the "domeAFL_FOV_Stereo.mi" mental ray include file to the include folder.

On Maya 2012:

> *C:\Program Files\Autodesk\Maya2012\mentalray\include*

On Maya 2013:

> *C:\Program Files\Autodesk\Maya2012\mentalray\shaders\include*

Step 4. Copy the Maya AE Template file "AEdomeAFL_FOV_StereoTemplate.mel" to either the Maya AETemplates folder or to your user account's Maya script folder:

> *C:\Program Files\Autodesk\Maya2012\scripts\AETemplates*

or

> *My Documents\maya\2012\prefs\scripts*

Step 5. Copy the Hypershade icons from the "Icons" folder to your Maya icons directory or to your user account's Maya icons directory:

> *C:\Program Files\Autodesk\Maya2012\icons*

or

> *My Documents\maya\2012\prefs\icons*

Step 6. The next time you start Maya you will find the "domeAFL_FOV_Stereo", "domeAFL_FOV", "domeAFL_WxH", and "rob_lookup_background" lens shaders in the Hypershade. Look in the create bar under the mental ray > lenses section.

Maya on Mac OS X

This version of the domeAFL_FOV_Stereo shader mental ray shader was compiled for Maya 2011 and 2012 for Mac OS X 64-bit. Mac OS X 10.6 Snow Leopard is required.

Step 1. Unzip the domemaster3D.zip archive.

Step 2. Copy domeAFL_FOV_Stereo.dylib file from the "Mac OS X 64-bit LIB" folder to the mentalray lib directory:

> */Applications/Autodesk/maya2012/Maya.app/Contents/mentalray/lib/*

If you want to go inside the Maya.app package, right click on Maya.app and select "Show Package Contents" from the contextual menu. You may have to change the mental ray folder permissions to allow the shader to be written to the lib and include directories.

On Maya 2013:

> */Applications/Autodesk/maya2013/mentalray/shaders/*

Step 3. Copy the "domeAFL_FOV_Stereo.mi" mental ray include file to:
On Maya 2012:

> */Applications/Autodesk/maya2012/Maya.app/Contents/mentalray/include*

On Maya 2013:

> */Applications/Autodesk/maya2013/mentalray/shaders/include*

Step 4. Copy the Maya AE Template file "AEdomeAFL_FOV_StereoTemplate.mel" to either the Maya AETemplates folder or to your user account's Maya script folder:

> */Applications/Autodesk/maya2012/Maya.app/Contents/scripts/AETemplates/*

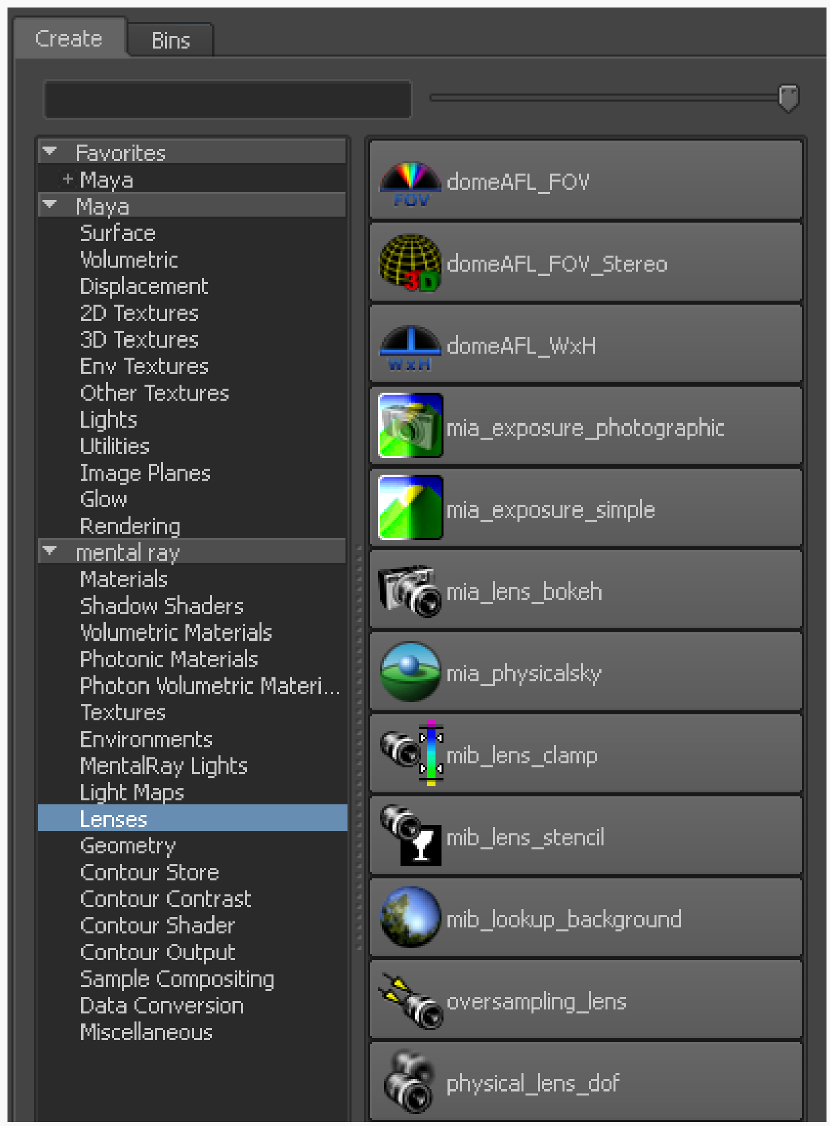
or

> *~/Library/Preferences/Autodesk/maya/2012-x64/prefs/scripts*

Step 5. Copy the Hypershade icons from the "Icons" folder to your Maya icons directory or to your user account's Maya icons directory:

> *~/Library/Preferences/Autodesk/maya/2012-x64/prefs/icons*

Step 6. The next time you start Maya you will find the "domeAFL_FOV_Stereo", "domeAFL_FOV", "domeAFL_WxH", and "rob_lookup_background" lens shaders in the Hypershade. Look in the create bar under the mental ray > lenses section.



The DomeAFL nodes should be visible in the Lenses section of the create bar.

Maya on Linux

This version of the domeAFL_FOV_Stereo shader mental ray shader was compiled for Maya 64-bit on RHEL 6.2.

Step 1. Unzip the domemaster3D.zip archive.

Step 2. Copy domeAFL_FOV_Stereo.so file from the "Linux X 64-bit LIB" folder to the mentalray lib directory:

> */usr/autodesk/maya2012-x64/mentalray/lib*

Step 3. Copy the "domeAFL_FOV_Stereo.mi" mental ray include file to:

> */usr/autodesk/maya2012-x64/mentalray/include*

Step 4. Copy the Maya AE Template file "AEdomeAFL_FOV_StereoTemplate.mel" to either the Maya AETemplates folder or to your user account's Maya script folder:

> */usr/autodesk/maya2012-x64/scripts/AETemplates/*

or

> *~/maya/2012-x64/prefs/scripts*

If you are running a copy of Maya prior to Maya 2011 you don't need to install the AETemplate file:

> *AEdomeAFL_FOV_StereoTemplate.mel*

Step 5. Copy the Hypershade icons from the "Icons" folder to your Maya icons directory or to your user account's Maya icons directory:

> */usr/autodesk/maya2012-x64/prefs/icons*

Step 6. The next time you start Maya you will find the "domeAFL_FOV_Stereo", "domeAFL_FOV", "domeAFL_WxH", and "rob_lookup_background" lens shaders in the Hypershade. Look in the create bar under the mental ray > lenses section.

3D Studio Max

Step 1. Unzip the domemaster3D.zip archive.

Step 2. Copy the appropriate "domeAFL_FOV_Stereo.dll" file from either the "Windows 32-bit LIB" or "Windows 64-bit LIB" folder or to your mental ray shaders folder:

> *\mentalray\shaders_autoload\shaders*

If you are running a 32-bit version of 3D Studio Max install the 32-bit DLL. If you are running a 64-bit version of 3D Studio Max install the 64-bit DLL.

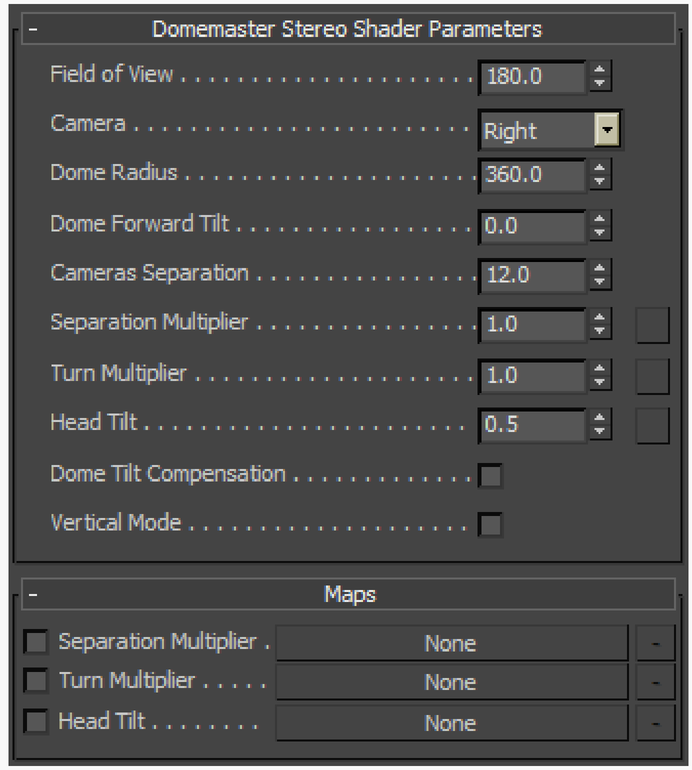
Step 3. Copy the "domeAFL_FOV_Stereo.mi" mental ray include file to:

> *\mentalray\shaders_autoload\include*

When you start 3D Studio Max, you will have 3 new Lens shaders:

> *"Domemaster Stereo Shader"*
> *"domeAFL_FOV"*
> *"domeAFL_WxH"*
> *"rob_lookup_background"*

DomeAFL_FOV_Stereo Shader Controls in 3DS MAX



This is the 3D Studio Max UI for the shader.

DomeAFL_FOV_Stereo Shader Controls in Maya

Field of View: The field of view for the rendered fisheye image.

Camera: Choices are Center/Left/Right. Selects the camera to use for rendering. Center skips 90% of the calculations and gives you a highly optimized standard angular fisheye shader.

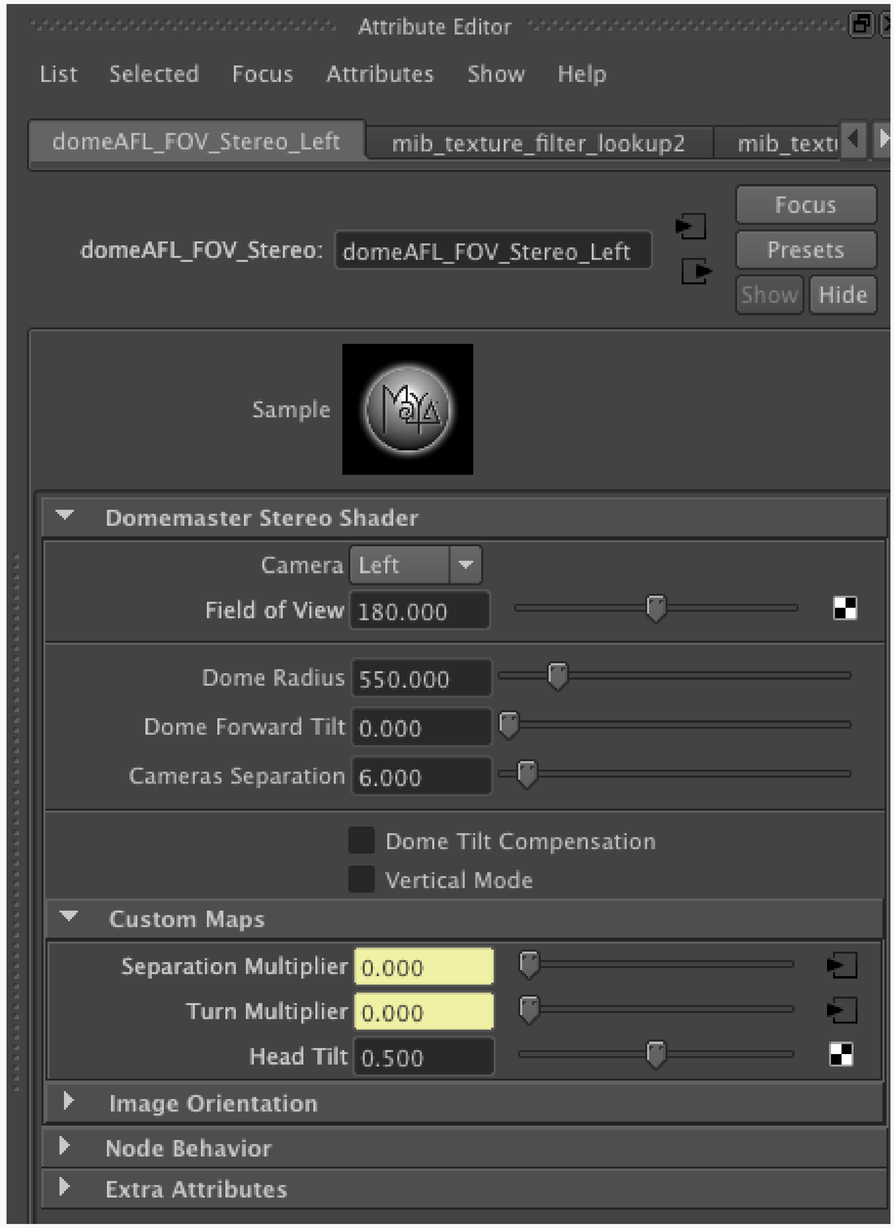
Dome Radius: (focus plane) This is actually the distance at which the camera's line of sight converge, so it's not really the dome size.

Dome Forward Tilt: Dome tilt in degrees. Note that this value is not used unless you enable Dome Tilt Compensation.

Camera Separation: The initial separation of the L/R camera's.

Separation Multiplier: A value between 0-1 that multiples the Camera Separation. This attribute is meant to be used with a grayscale texture mapped to the screen space using the right button. It's used to control the amount of 3D effect, and eliminate it where desired.

Turn Multiplier: A value 0-1 that controls the amount of the head turn. To be used with a grayscale texture. Typical use, keep the head straight while looking at the top of the dome.



The Domemaster3D shader is controlled in Maya using the Attribute Editor.

Head Tilt: A value 0-1 (with 0.5 being the "neutral" value) that tilts the cameras (or head) left/right. 0 means 90 degrees to the left, 1 means 90 degrees to the right (if I remember correctly).

Dome Tilt Compensation: Enabling this option, shifts all the calculations by the # of degrees specified in Dome Forward Tilt. (Basically, it keeps the cameras/head vertical while the dome rotates forward.)

Maps used for the various multipliers and tilt settings will have to be custom made for the proper dome tilt.

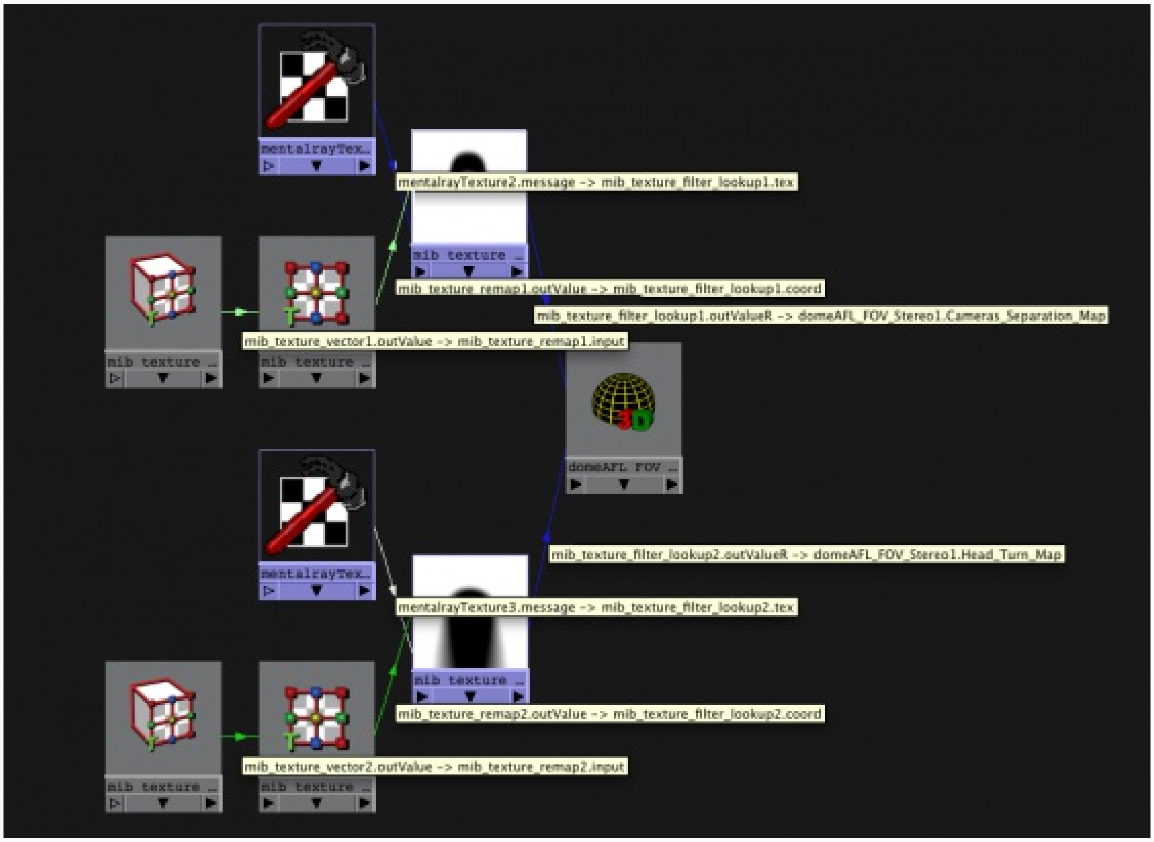
Vertical Mode: Enable the vertical dome mode, which automatically adjusts the head turn and adds a turn compensation for the upper and lower part of the dome. It's a simplified and optimized version of the Dome Tilt Compensation with a 90 degrees tilt. It is faster and easier to use.

Essential Node connections

The Separation Multiplier, Turn Multiplier, and Head Tilt attributes support custom texture maps. It is possible to use either a procedural ramp / gradient texture or 2D file textures.

It can be challenging to map textures to mental ray's screen space coordinates so I have provided an example scene with the Domemaster3D shader download.

This is the "Getting Started Guide" I wish I had when I started porting the Domemaster stereo shader to Maya. It is VERY detailed because it covers all of the steps required to start creating content for stereoscopic fulldome theaters using Autodesk Maya.

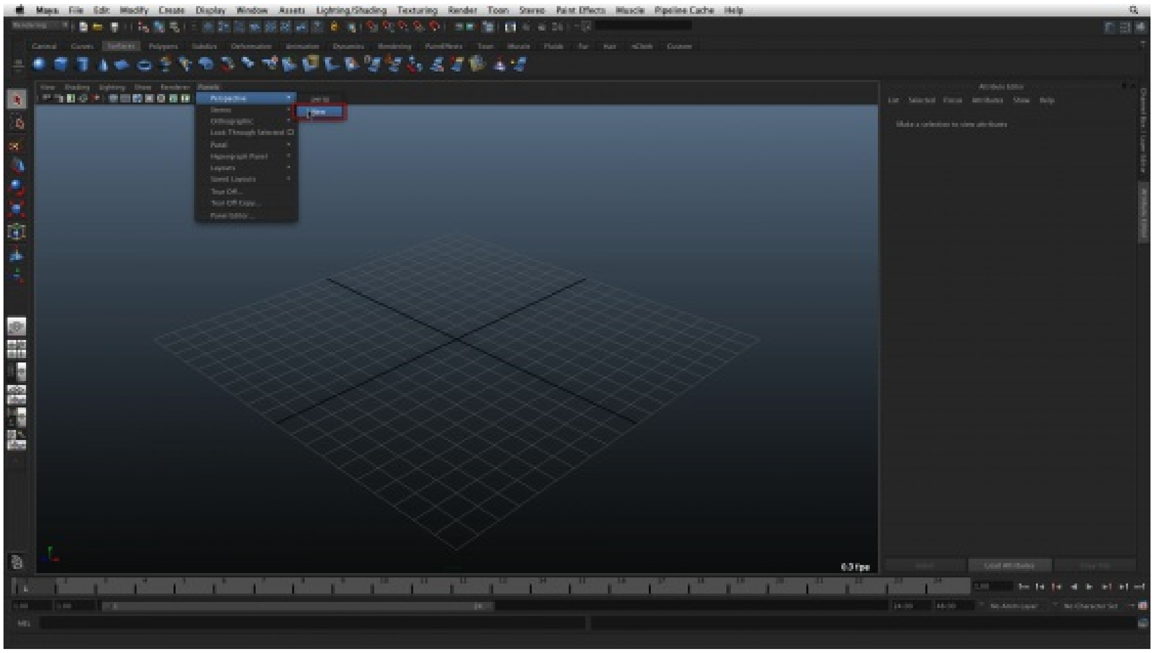


This is the shading network required to map the textures into mental ray screen space coordinates.

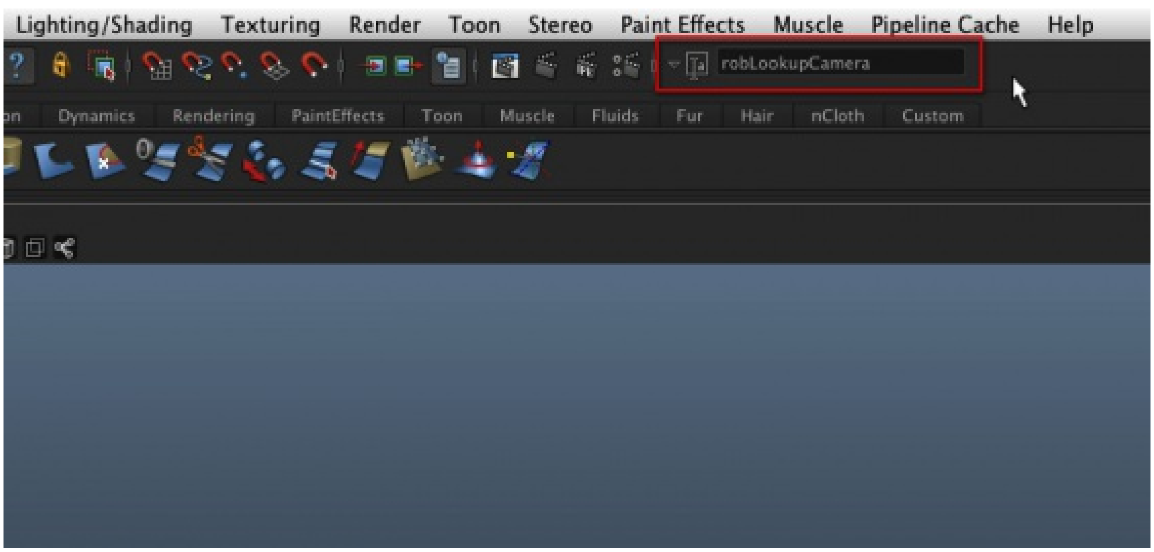
Step 1. Creating the Base Domemaster3D Shading Network

Before we add the DomeAFL_FOV_Stereo node to the scene we need to create the base shading network connections for the Domemaster3D shader. We are going to use the rob_lookup_background shader to preview our dome control textures in the special "screen coordinate space"**.** The **rob** part of shader name is due to the fact it was developed by **Rob**erto Ziche.

Let's get started.



To use the rob_lookup_background shader we need to add a new camera to the scene. In the viewport, from the **Panels** menu select **Perspective > New**. This created a new camera. Let's change the name of the camera to **robLookupCamera**.



We are going to use the Hypershade to create the custom shading network. Click in the perspective view and hold down the spacebar to display the hotbox. From the north zone, select the **Hypershade/Render/Perspective** layout.

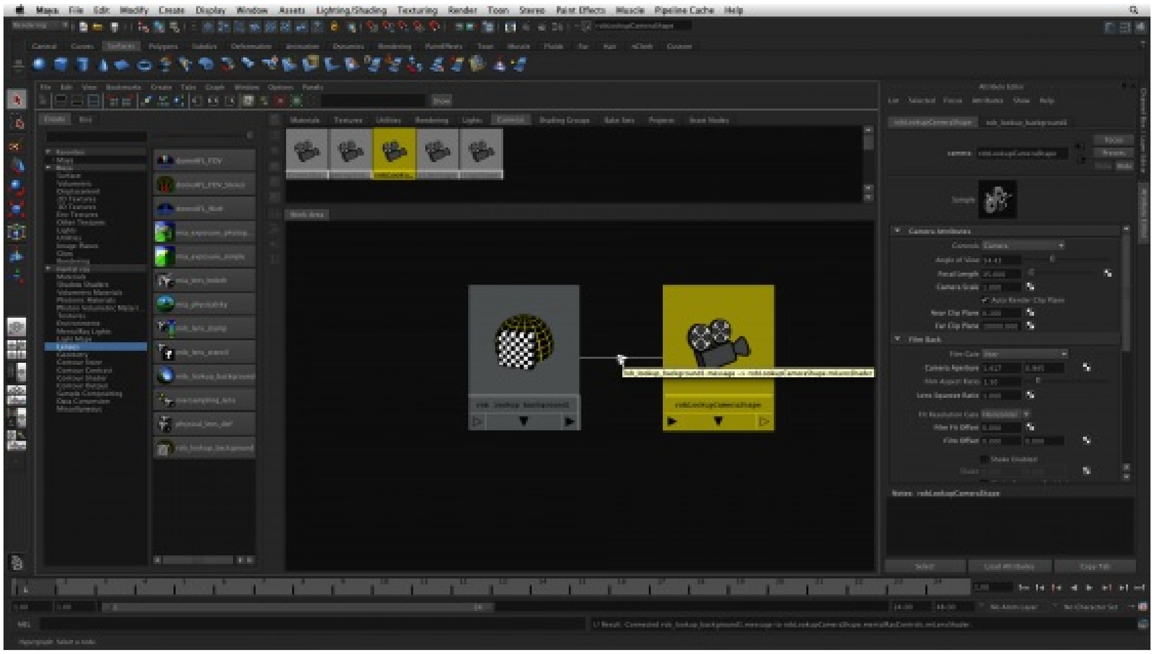
Click in the Hypershade and tap the spacebar to maximize the view.

Select the **Cameras** tab to display a list of the active cameras in our scene. Drag the **robLookupCameraShape** node from the Cameras tab to the work area.

In the create bar click on the **mental ray > lenses** section. Click on the **rob_lookup_background** icon in the create bar to add the shader to the Hypershade work area.

Let's connect the rob_lookup_background lens shader to the new camera. Using the middle mouse button drag the **rob_lookup_background** node onto the **robLookupCameraShape** node. In the connect pop-up menu select **default**.

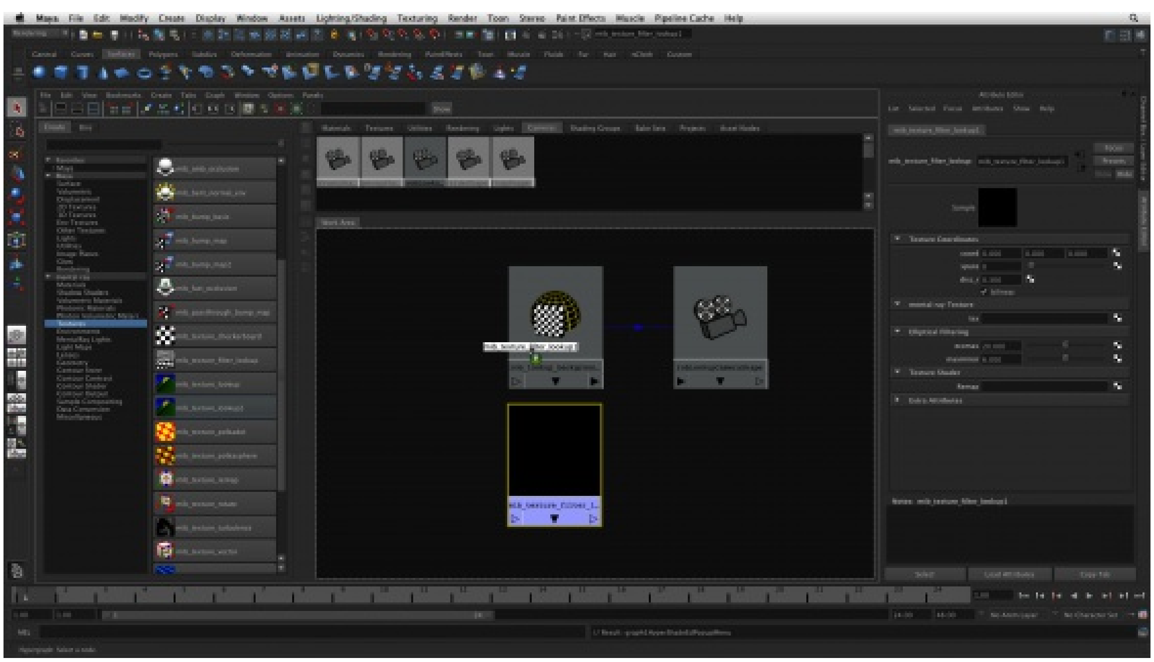
This has connected **rob_lookup_background.message** to **robLookupCameraShape.miLensShader**.



The next step is to create the texturing and screen space conversion nodes for the shading network.

In the create bar, click on the mental ray textures section. Add a "mib_texture_filter_lookup" node to the work area. This node will merge the image data with the screen space UV coordinate system.

We are going to map a greyscale output from the mib_texture_filter_lookup node to the rob_lookup_background shader's greyscale **tex** attribute.

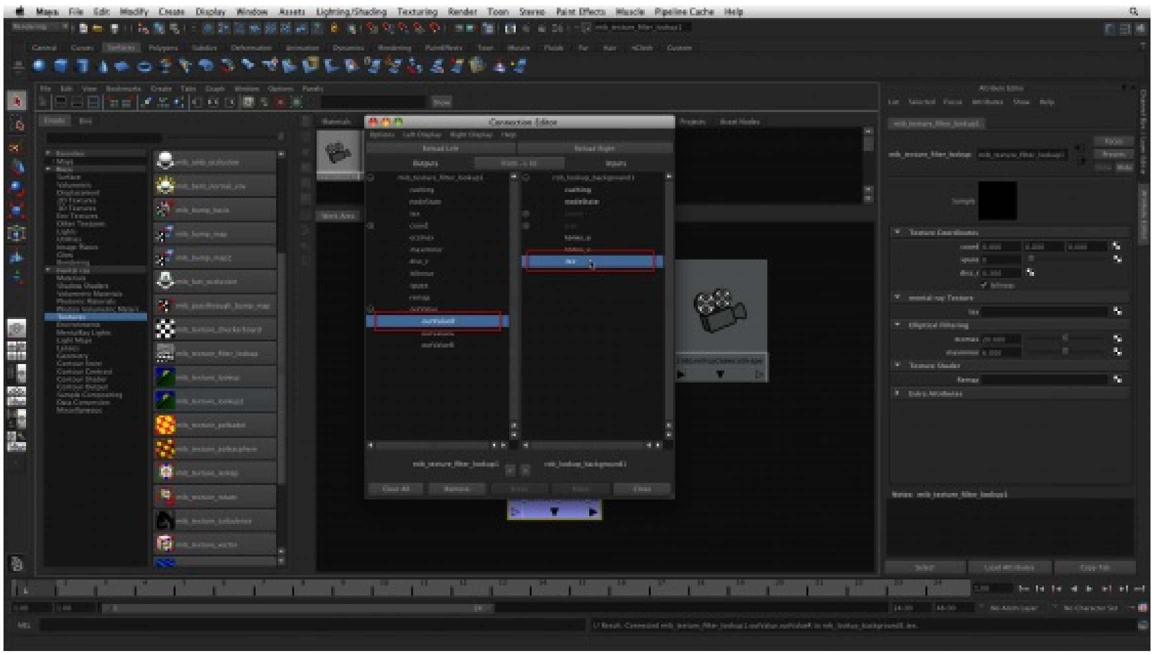


Using the middle mouse button drag the **mib_texture_filter_lookup** node onto the **rob_lookup_background** node. In the connect pop-up menu select **Other...**

In the connection editor expand the mib_texture_filter's **outValue** attribute on the left side of the window and select the **outValueR** attribute. On the right side of the connection editor window select the **tex** attribute.

Click the close button in the connection editor to hide the window.

This has connected **mib_texture_filter_lookup.outValueR** to **rob_lookup_background.tex**.

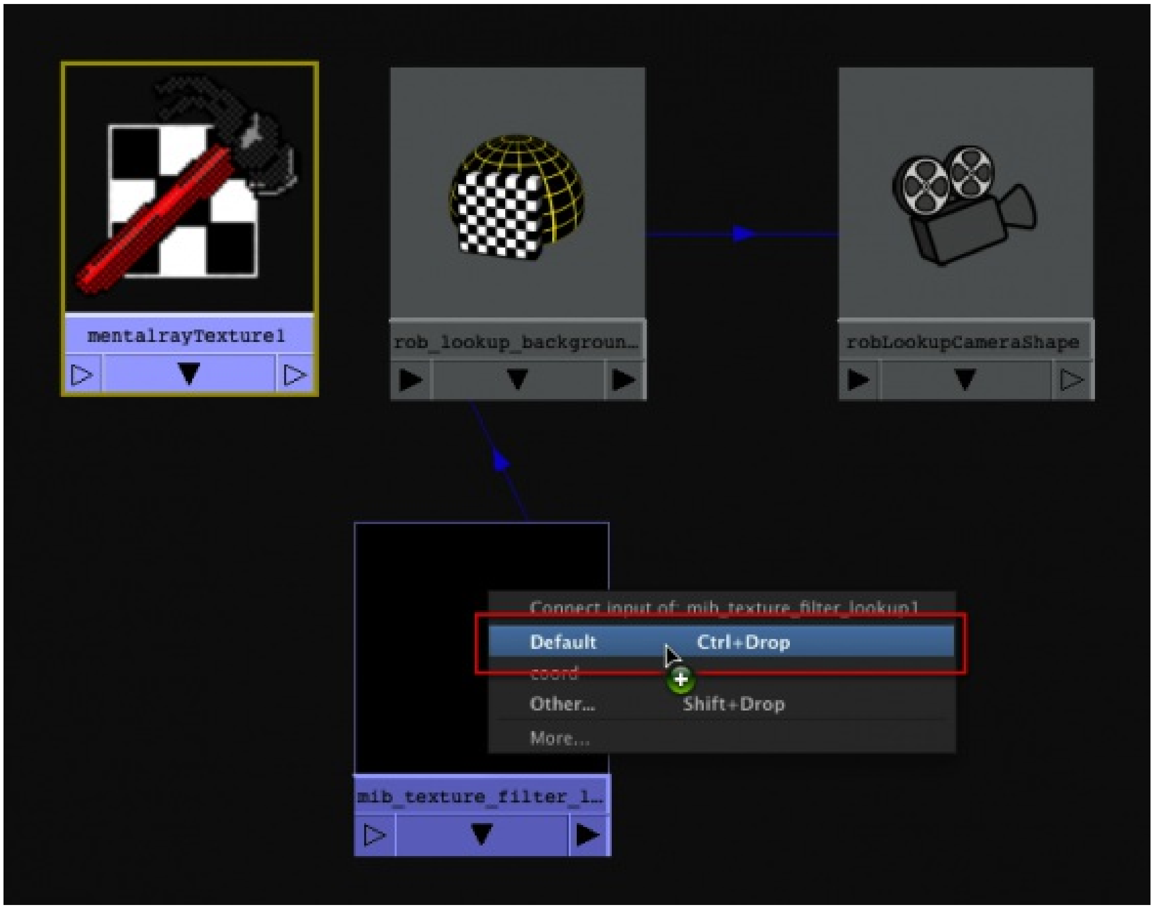


Next we are going to add a mentalrayTexture node to the work area. This node will load the actual file texture for the separation map. In the textures section of the create bar click on the **mentalrayTexture** node.

Select the **mentalrayTexture** node in the Hypershade work area. In the attribute editor, click on the folder icon next to the **Image Name** field. Select the **separation_map.png** image from the project's sourceimages folder and click open.

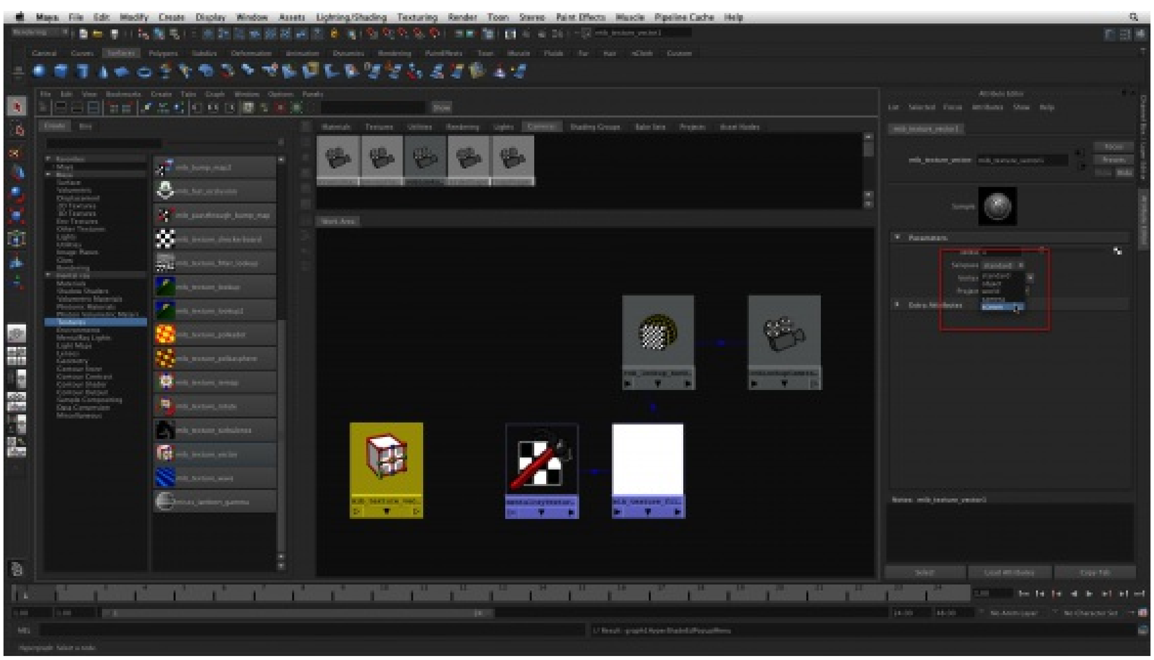
In the Hypershade work area drag the **mentalrayTexture** node onto the **mib_texture_filter_lookup** node. From the connect pop-up menu select **default**.

This has connected **mentalrayTexture.message** to **mib_texture_filter_lookup.tex**



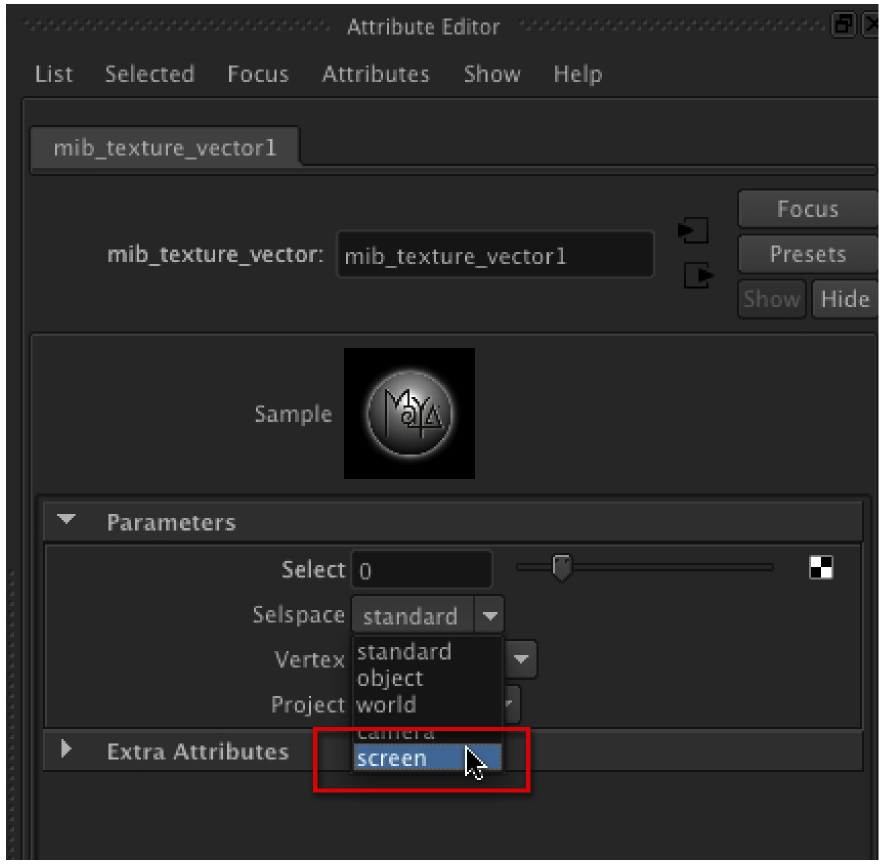
Now let's connect the mental ray nodes required to create the screen space texture coordinates.

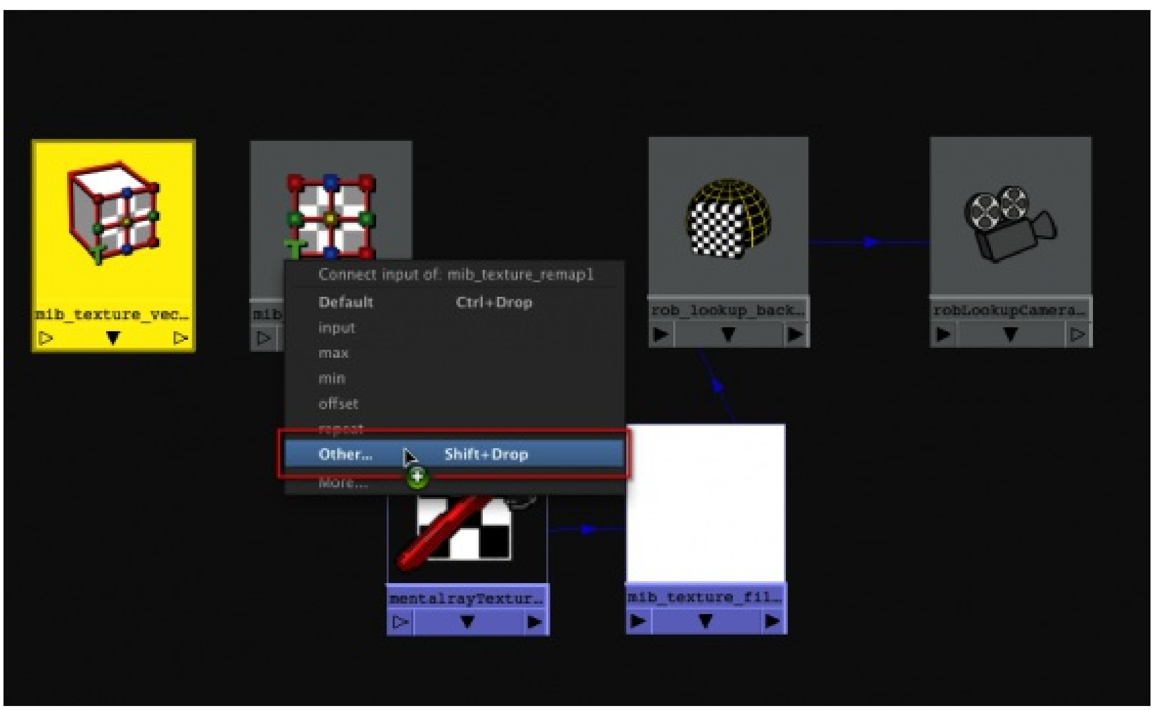
Let's add a mib_texture_vector node to work area. In the create bar from the **mental ray > Textures** section, click on the **mib_texture_vector** node.



Select the **mib_texture_vector** node in the work area. In the attribute editor you will see an attribute called **selspace**. This attribute stands for "select space" and it allows you to choose the source space used for texture mapping. Change the mib_texture_vector node's **selspace** value to **screen**. This setting allows us to project the separation map onto the camera using mental ray screen space UV coordinates.

We need to add one more node to the work area. In the create bar from the **mental ray > textures** section, click to add a **mib_texture_remap** node. In the Hypershade work area, use the middle mouse button to drag the **mib_texture_vector** node onto the **mib_texture_remap** node. From the connect pop-up menu select **Other...**

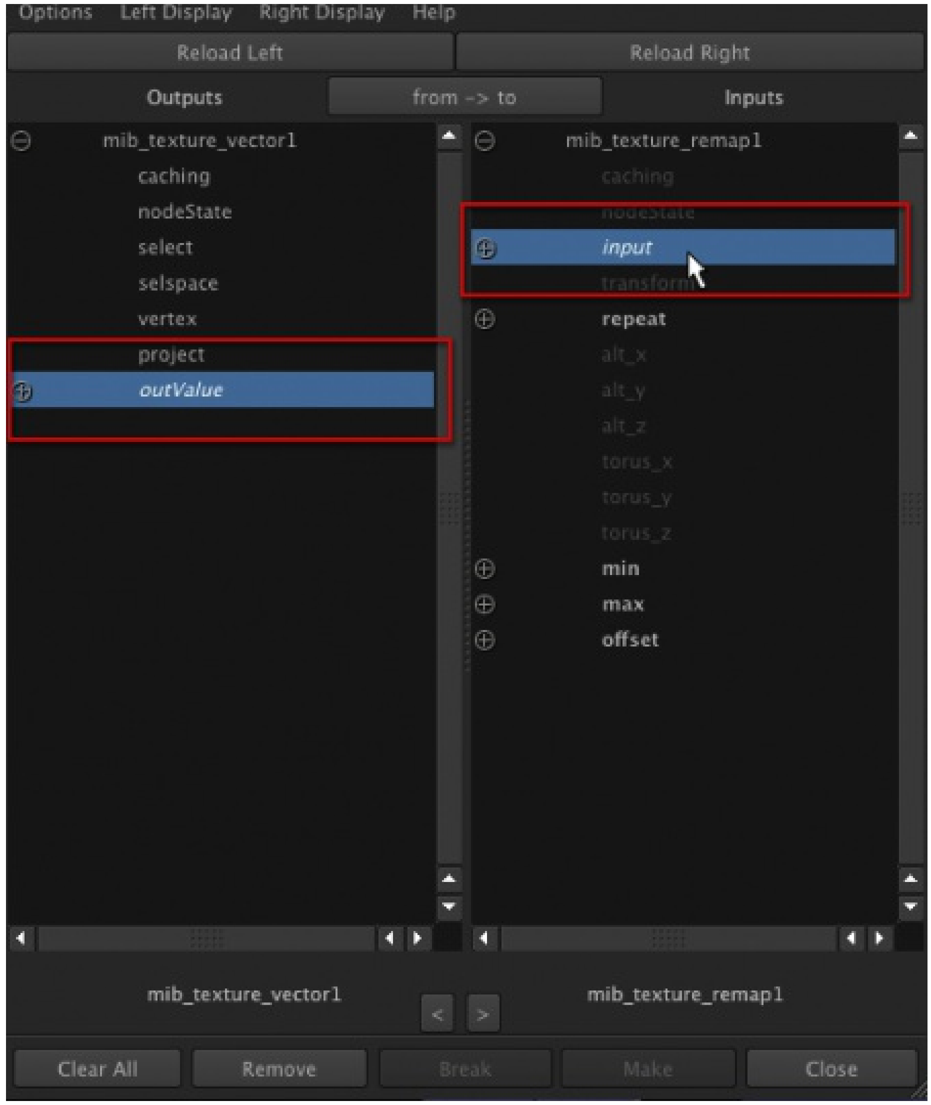


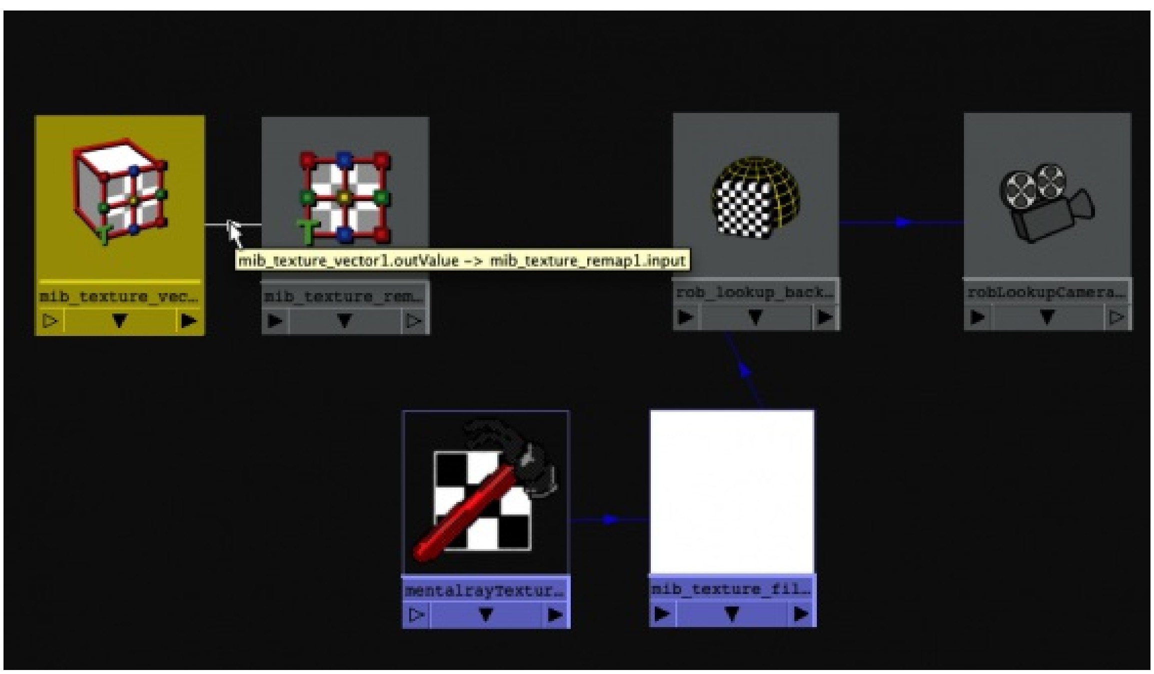


In the connection window select the mib_texture_vector **outValue** attribute on the left and the mib_texture_remap **input** attribute on the right.

Click the close button to hide the connection editor.

This has connected
mib_texture_vector.outValue
to the
mib_texture_remap.input.





We have one last node to add to the work area.

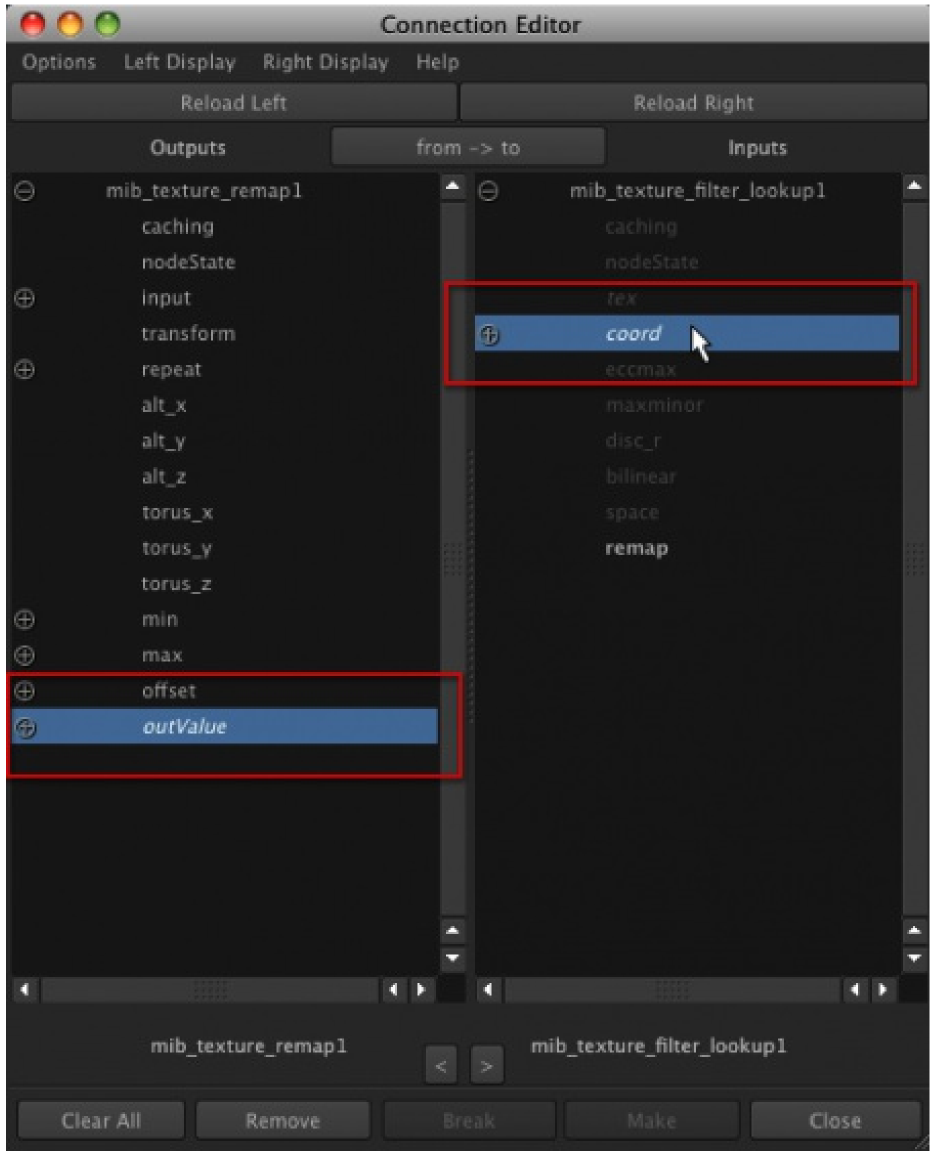
Using the middle mouse button drag the **mib_texture_remap** node onto the

mib_texture_filter_lookup node. From the connect popup menu select **Other...**

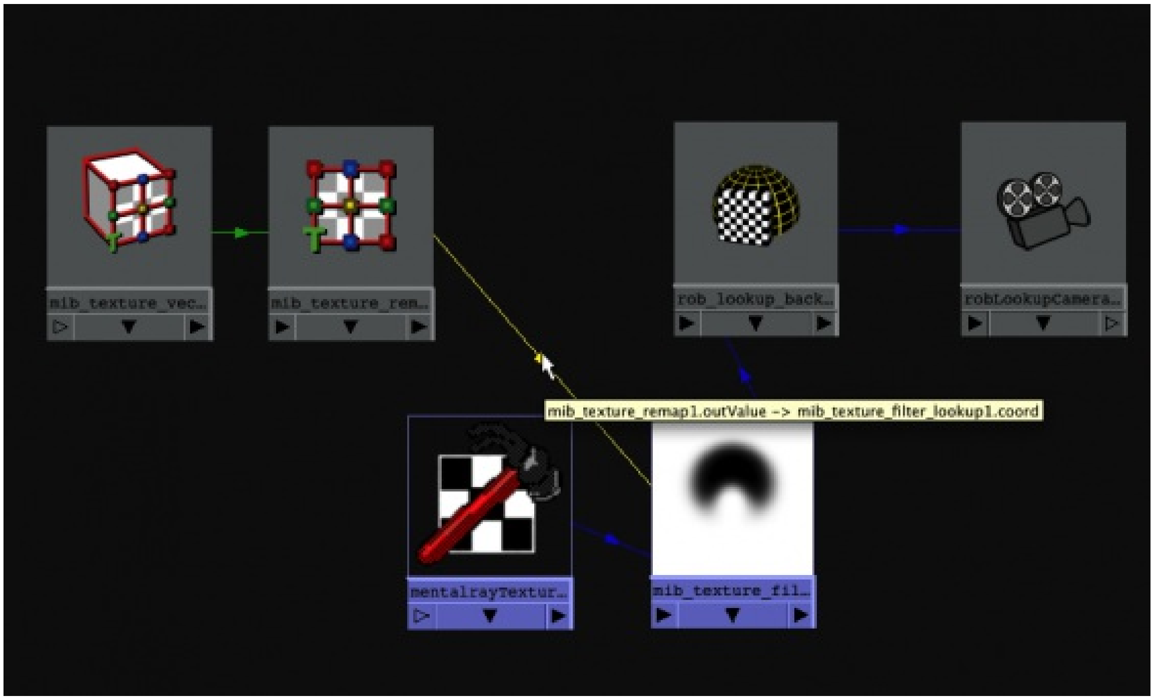
In the connection window select the mib_texture_remap **outValue** attribute on the left and the mib_texture_filter_lookup **coord** value on the right. Click the close button to hide the connection editor.

Click the close button to hide the connection editor.

This has connected the **mib_texture_remap.outValue** to the **mib_texture_filter_lookup.coord**.



If everything is hooked up properly the **mib_texture_filter_lookup** node should now display a crescent shaped preview icon.

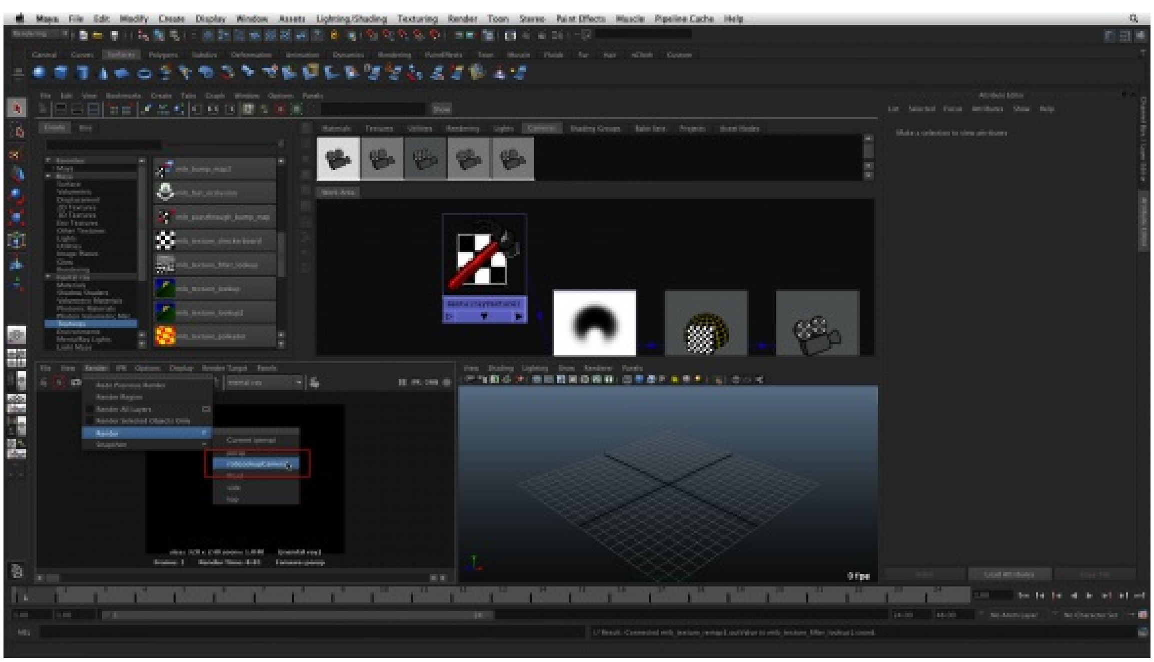


Let's cleanup the layout of the work area by clicking on the **rearrange graph icon** in the Hypershade toolbar. Click in the work area and press the **A** key on your keyboard to fill the view with the nodes.

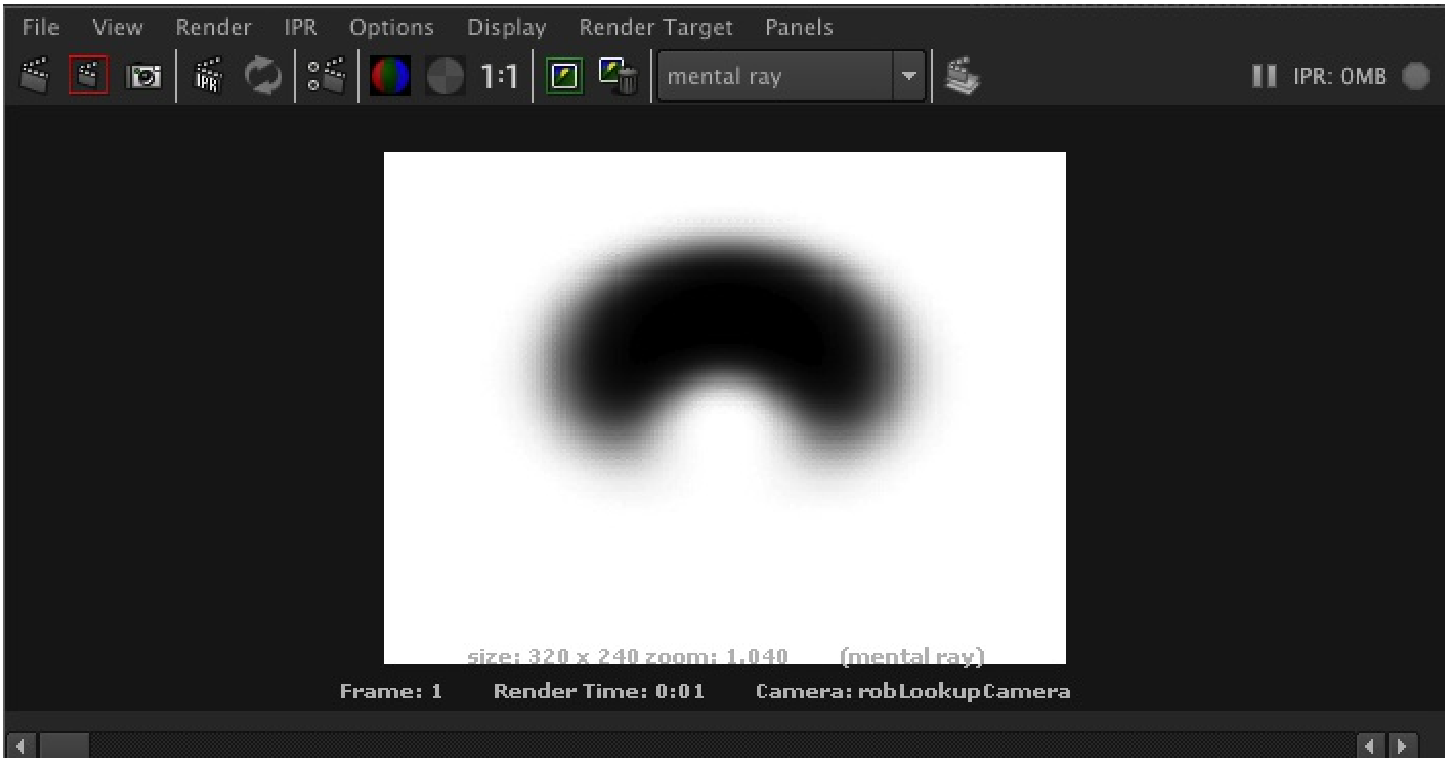
With this shading network we can now preview the Domemaster3D screen space texture maps.

Let's see the results of the rob_lookup_background shader by doing a test render using the render view.

Tap the spacebar to return to the **Hypershade / Render / Perspective** layout.



In the render view from the Render menu, select **Render > robLookupCamera**. If the shading network is setup correctly we should see the black crescent shape from the separation texture map.



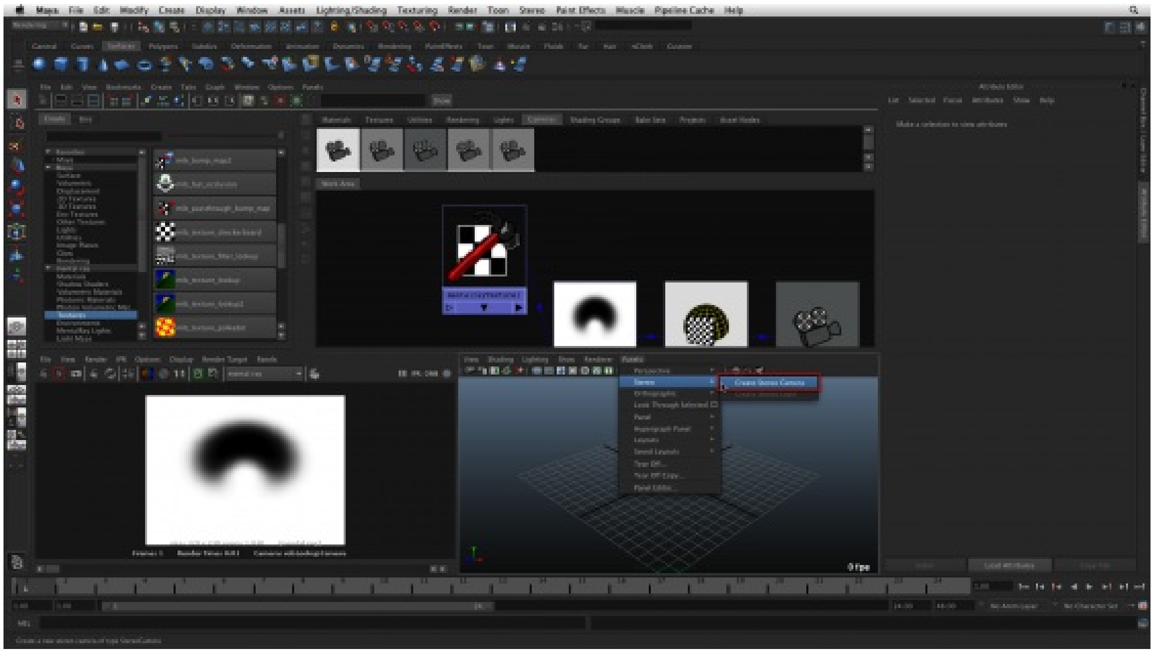
In the next step we are going to add a stereo camera rig to our Maya scene and connect the custom texture maps to the domeAFL_FOV_Stereo node.

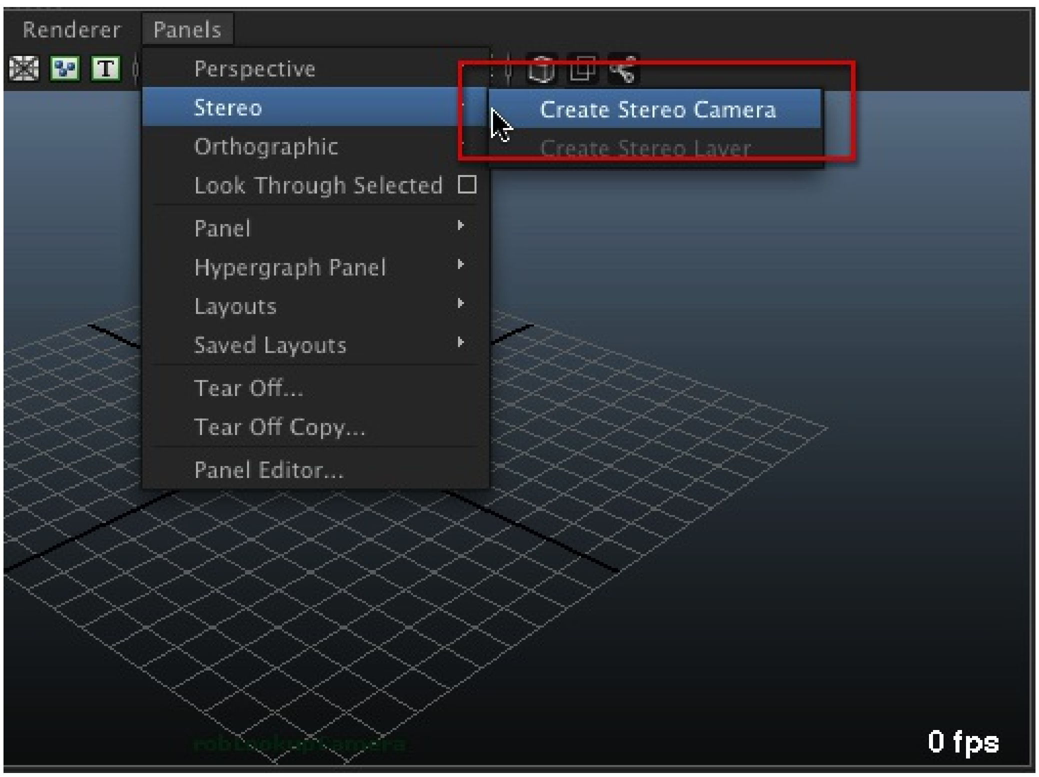
Step 2. Creating a Stereo Camera Rig in Maya

It's possible to use the Domemaster3D shader with Maya's stereo camera rig. This setup makes it easy to animate the stereo camera in your scene and also allows you to preview your Maya renders in the render view using anaglyph 3D glasses.

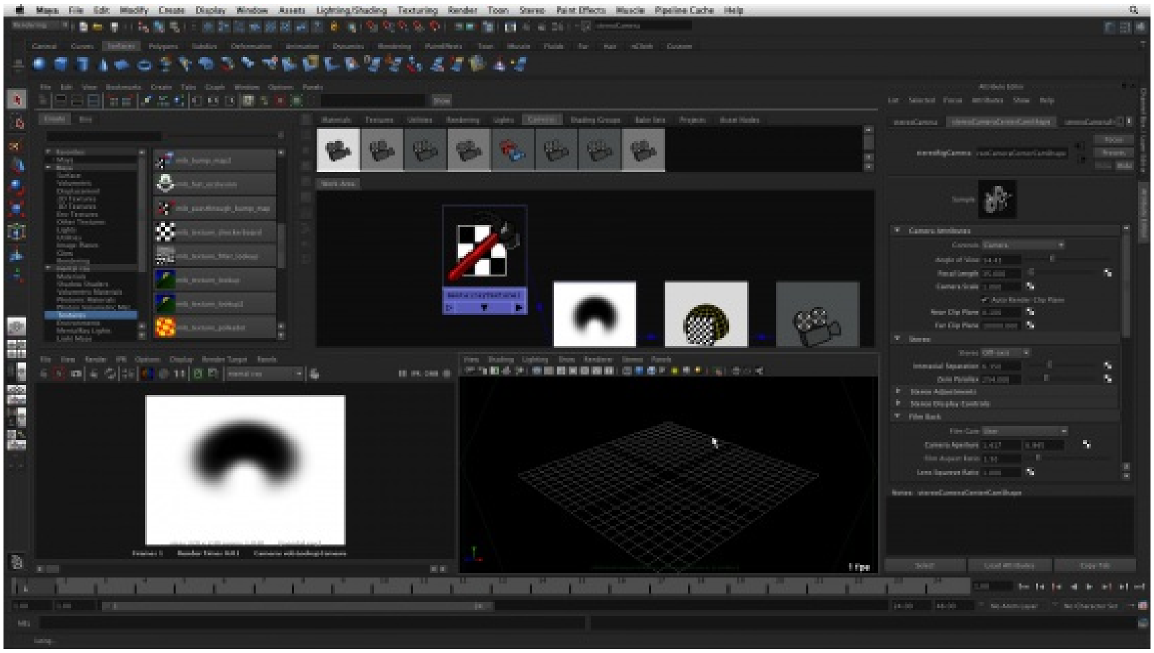
Let's add a stereo camera rig to our scene.

In the perspective viewport select the **Panels > Stereo > Create Stereo Camera** menu item.





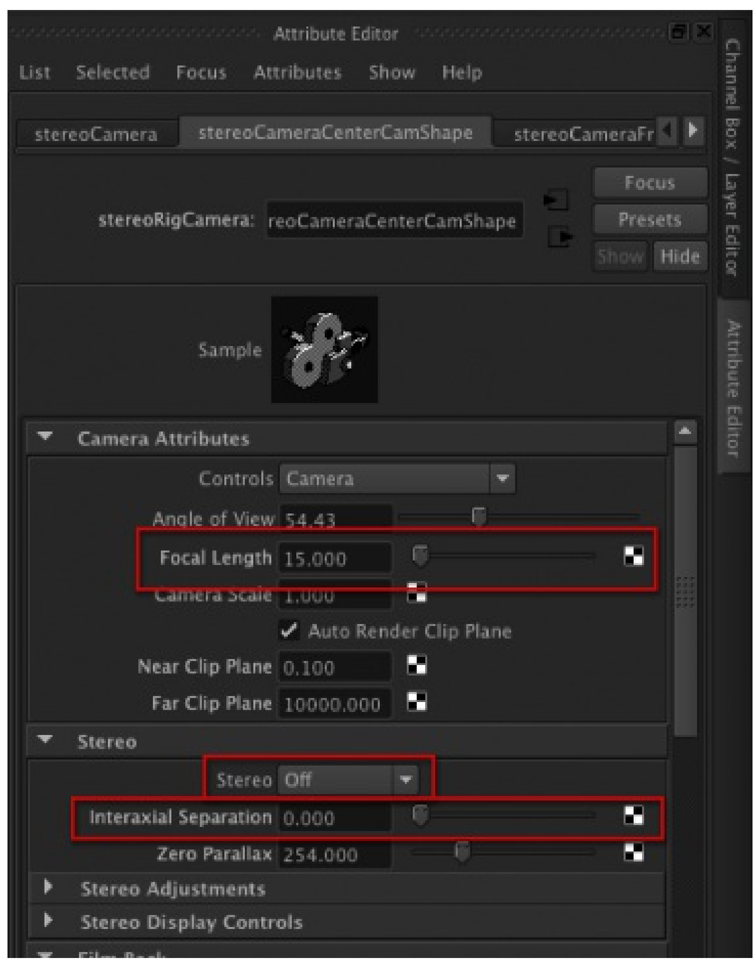
We now have a stereo camera rig to our scene. We need to edit the stereo rig's camera attributes so it is compatible with the Domemaster3D shader. From the **Panels** menu select **Stereo > stereoCamera**.



In the attribute editor make sure the **stereoCameraCenterCamShape** tab is selected. Scroll down to the **Stereo** section.

We need to modify the default stereo rig attributes to allow the DomeAFL_FOV_Stereo shader to control the camera separation settings. Start by setting the **Interaxial Separation** to **0.0**. Next we need to change the **Stereo** pop-up menu from **Off-axis** to **Off**. This will disable the standard stereo convergence settings.

Let's change the realtime viewport's field of view attributes. In the attribute editor change the focal length to 15 millimeters so we have a wider field of view. This makes it easier to frame the shot. This field of view setting will only affect the realtime viewport in the perspective view. The domeAFL_FOV_stereo shader will still control the angular fisheye field of view attribute at render time.



Step 3. Adding the domeAFL_FOV_Stereo Node

In this step we are going to add a domeAFL_FOV_Stereo node and connect it to the stereo camera rig.

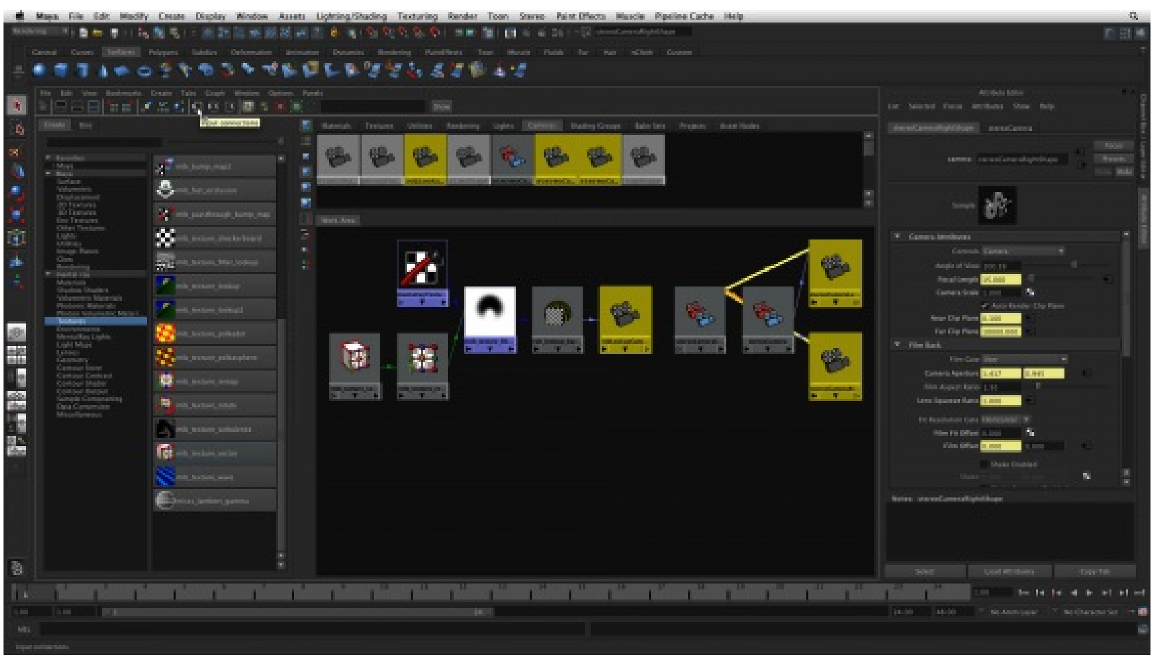
Click in the Hypershade and tap the spacebar to maximize the view.

The custom texture map shading network we created in step 1 is important for controlling the positioning of the stereoscopic effect on the fulldome screen and to reduce rendering artifacts that would be visible from the head turn feature at top of the fulldome screen.

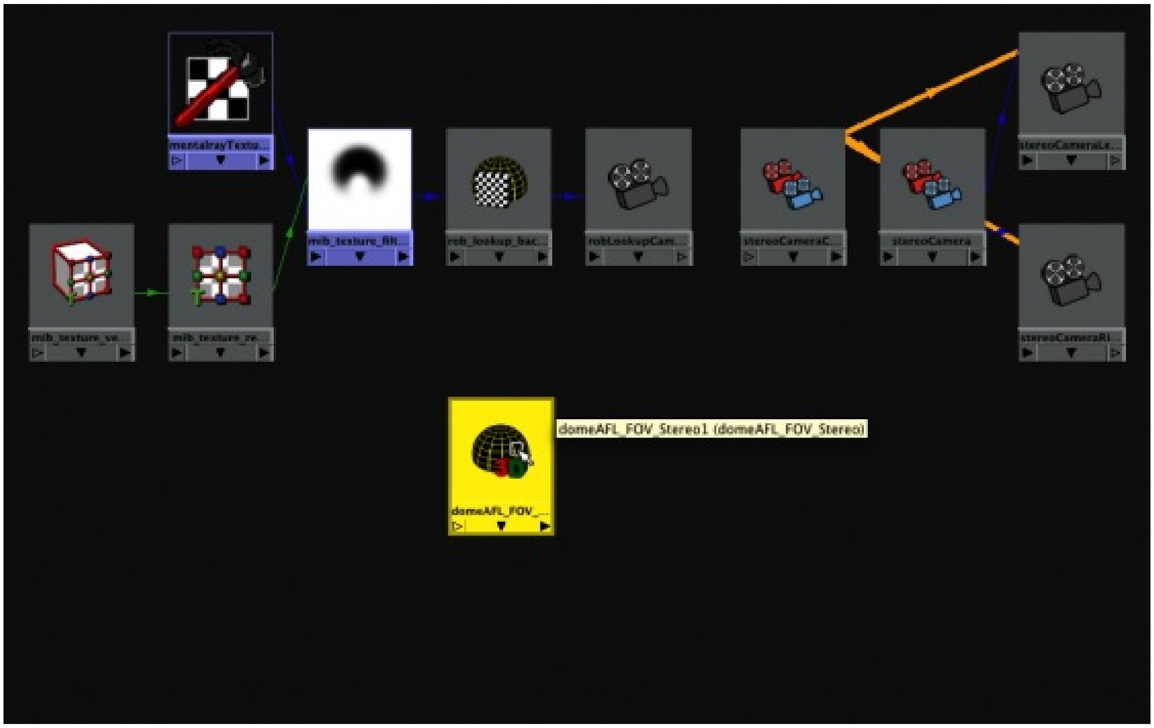
In the cameras tab we need to select the left and right cameras used by the stereo camera rig and the robLookupCamera created in the previous step. Click in the cameras tab and hover your mouse cursor over the camera node icons to see the full length names of the cameras.

Select the **robLookupCameraShape**, the **stereoCameraLeftShape** and **stereoCameraRightShape** nodes.

Click the **show input connections** icon in the Hypershade toolbar. This is has added the nodes to the work area and displayed the node's input connections.



Let's add a domeAFL_FOV_stereo node to work area. From the create bar select the **mental ray > lenses** section. Then click on the **domeAFL_FOV_Stereo** icon to add the node to the work area.



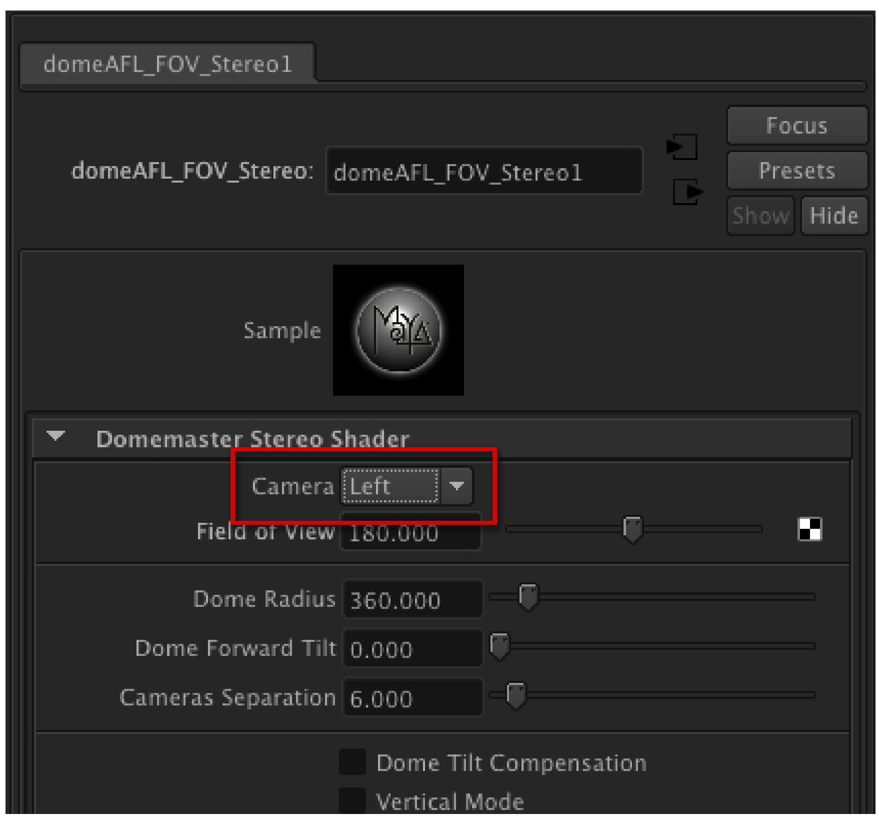
This node will be used for rendering the angular fisheye view for the left camera in the stereo rig. Click on the **domeAFL_FOV_Stereo** node in the work area. In the attribute editor use the **camera** pop-up menu to set the camera view to "**Left**".

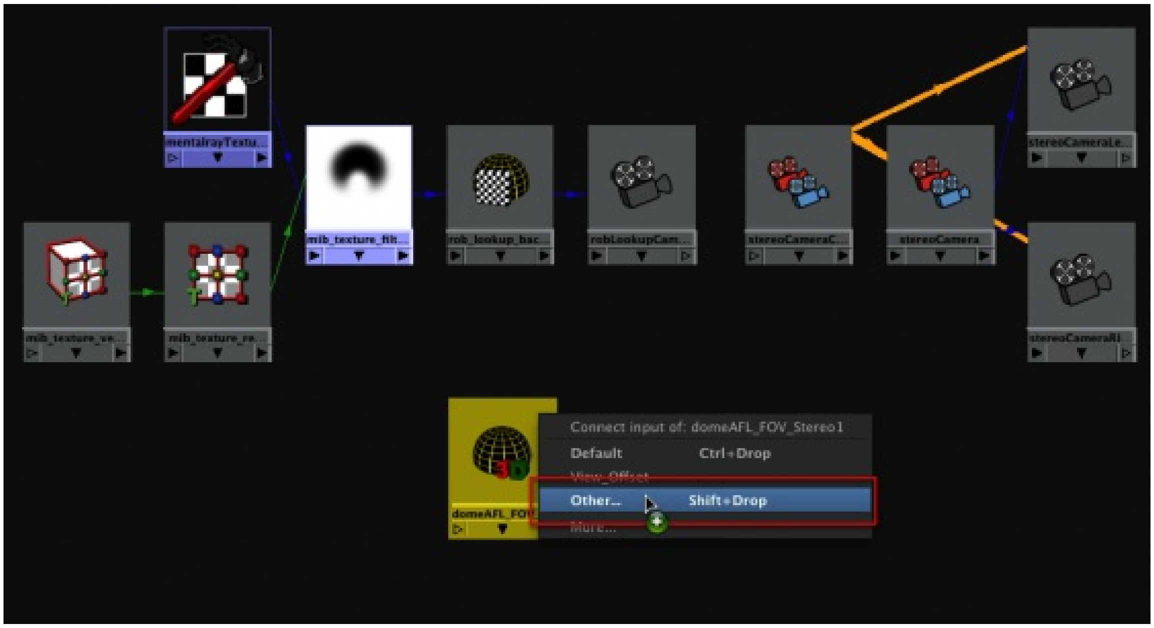
For this tutorial we will leave the **Camera's Separation** value at **6 cm**.

If you scale the size of the camera's transform node to make the icon larger in the perspective view, it will result in the camera scale having a direct multiplying effect on the current **camera separation** value.

Now we are going to connect a greyscale channel from the separation texture map shading network to the domeAFL_FOV_Stereo node.

Using the middle mouse button drag the **mib_texture_lookup** node onto the **domeAFL_FOV_Stereo** node. From the connect pop-up menu, select **Other...**

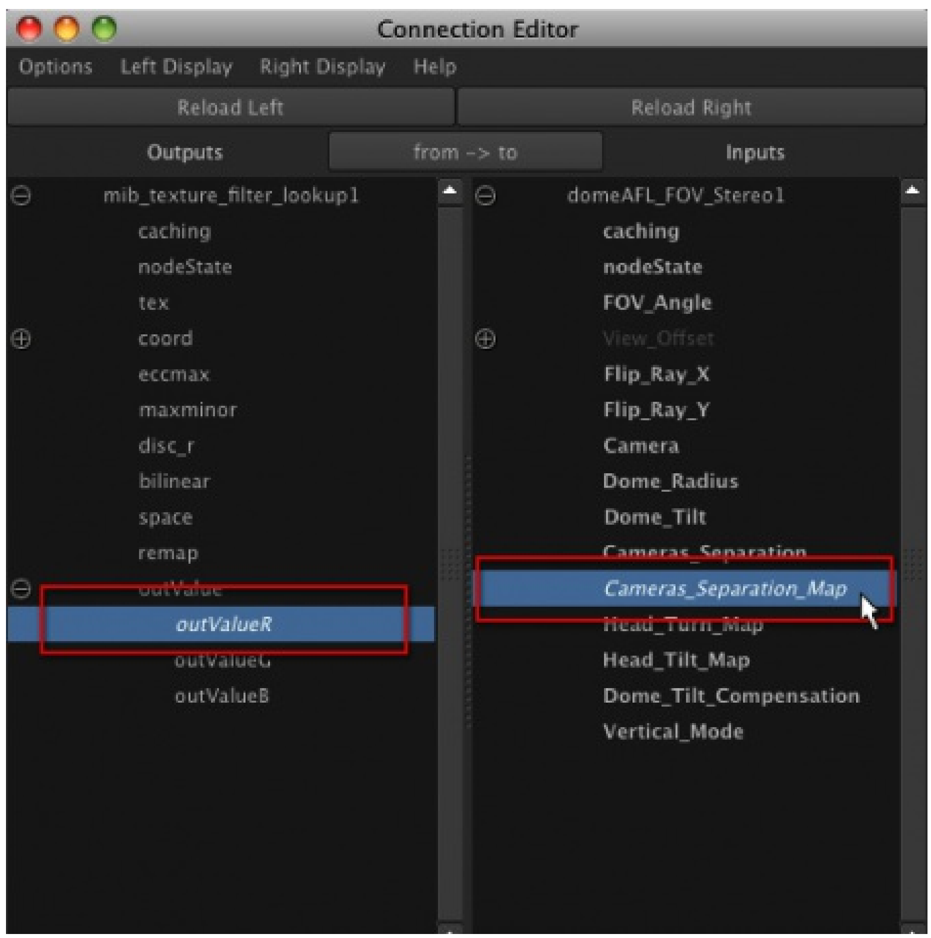




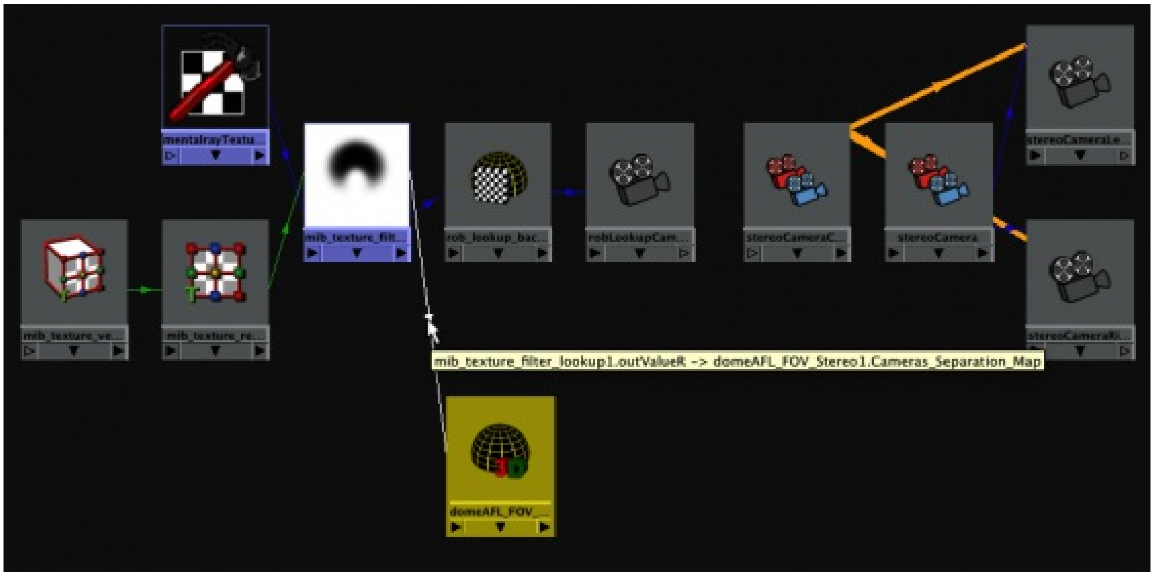
On the left side of the connection editor, expand the domeAFL_FOV_Stereo **outValue** attribute and select **outValueR**. On the right side of the connection editor, select **Cameras_Separation_Map**.

Close the connection editor.

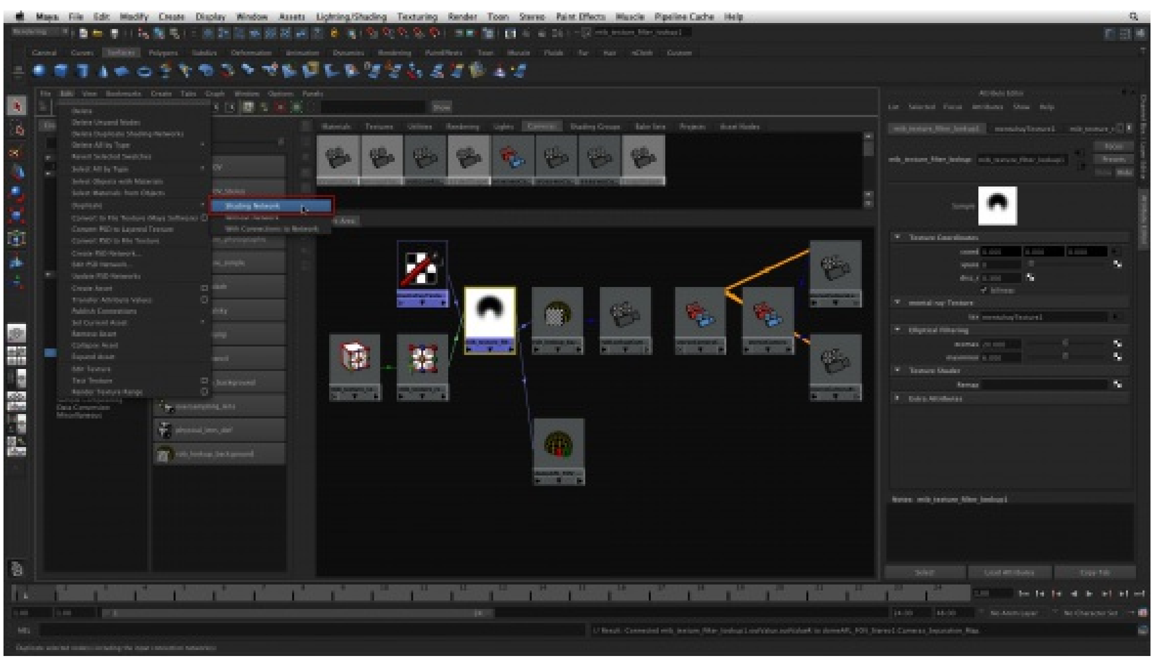
This has connected



mib_texture_lookup.outValueR to **domeAFL_FOV_Stereo.Cameras_Separation_Map**.



We're now going to connect a head turn texture map also known as the "Turn Multiplier" to the domeAFL_FOV_Stereo node. To save time, let's duplicate the existing mib_texture_lookup node's shading network.

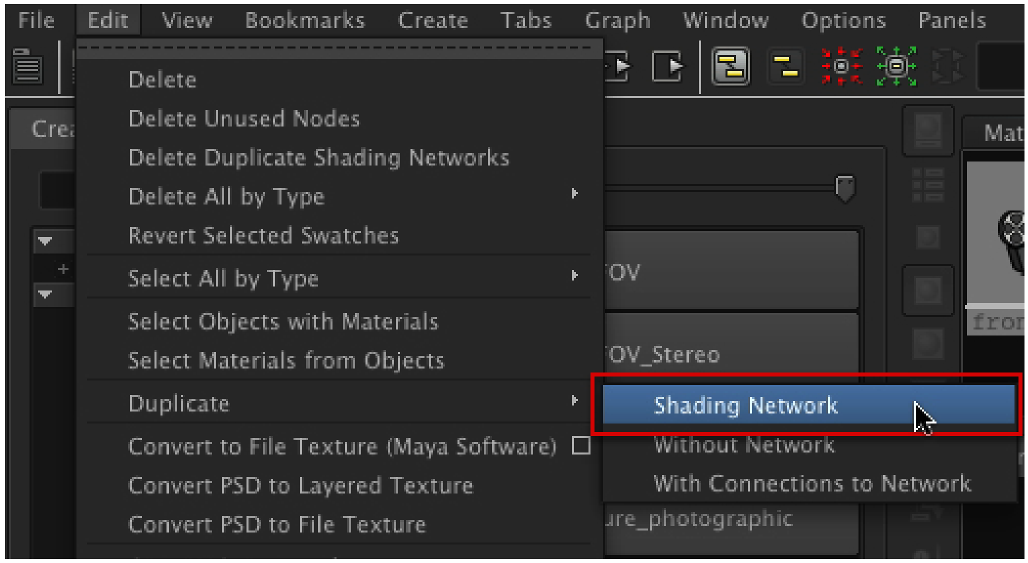


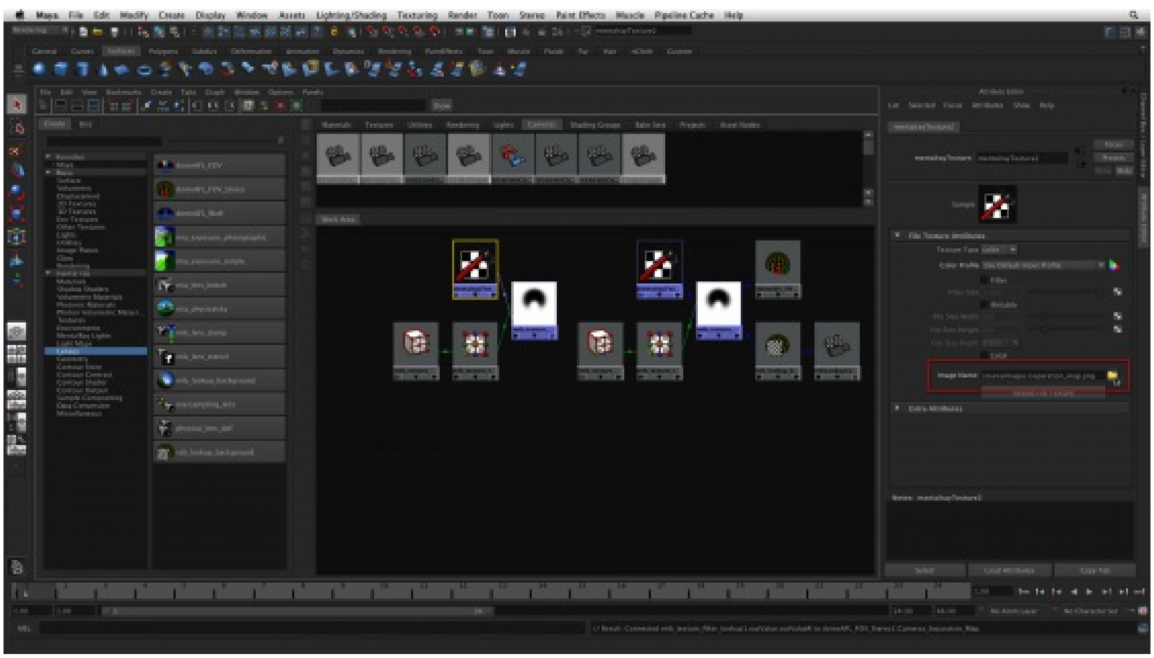
Select the **mib_texture_lookup** node in the work area. From the Hypershade's **Edit** menu, select **Duplicate > Shading Network**.

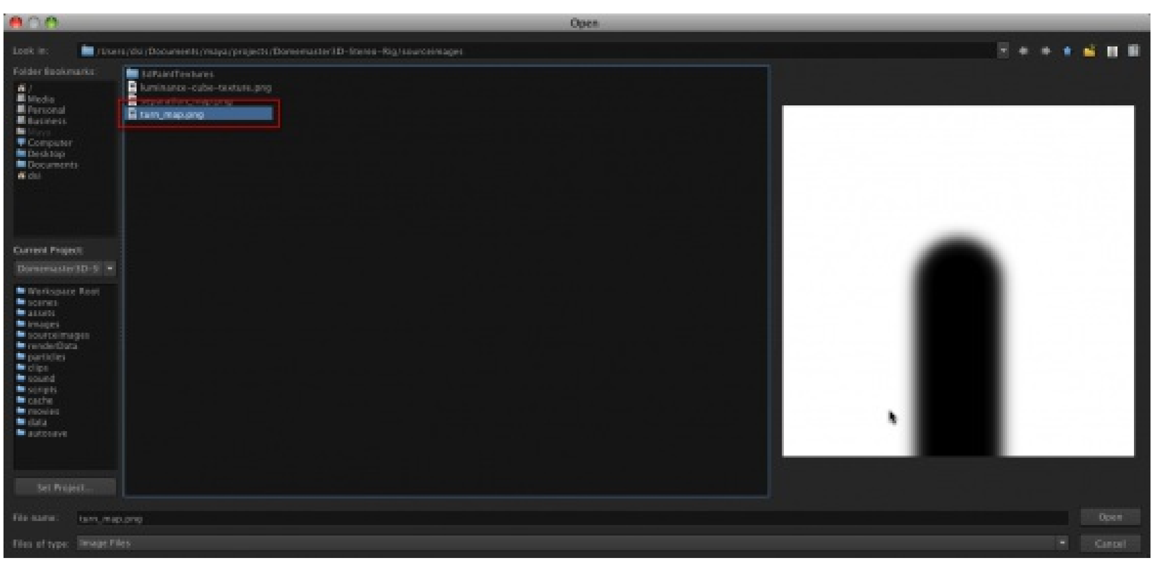
Let's clean up the view in

the work area by rearranging the nodes. Click the **rearrange graph** icon in the toolbar.

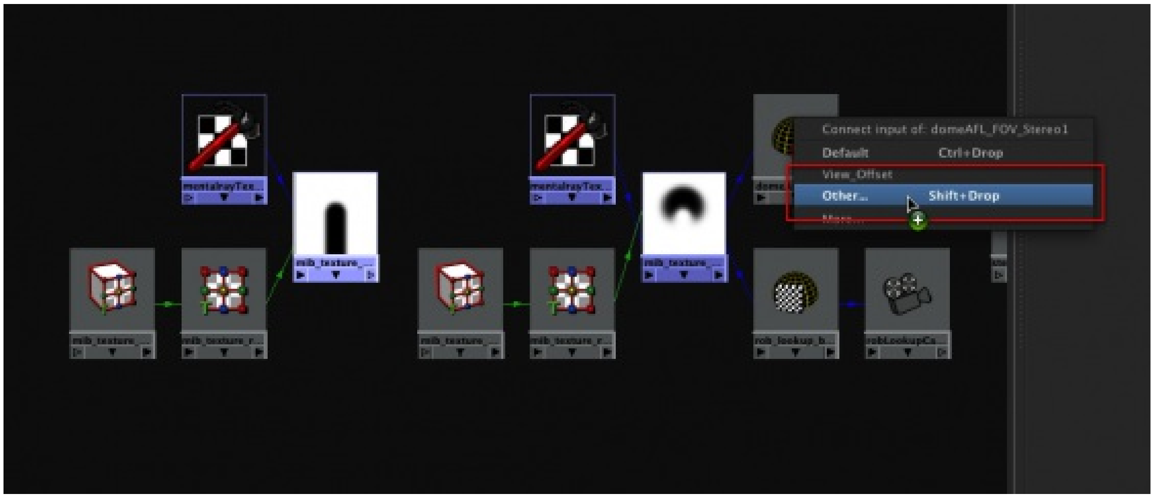
We need to link the head turn map PNG texture to the mental ray texture node. Select the copied **mentalrayTexture** node in the work area. In the attribute editor, click the folder icon next to the image name field. We are now going to select the head turn texture map. In the open dialog select **turn_map.png** and click open.







To force the node icon swatch to update lets reconnect the mentalrayTexture node to the mib_texture_filter_lookup node. Click on the line connecting the two nodes and press the delete button. Using the middle mouse button drag the **mentalrayTexture** node onto the **mib_texture_filter_lookup** node. From the connect pop-up, select **default**.

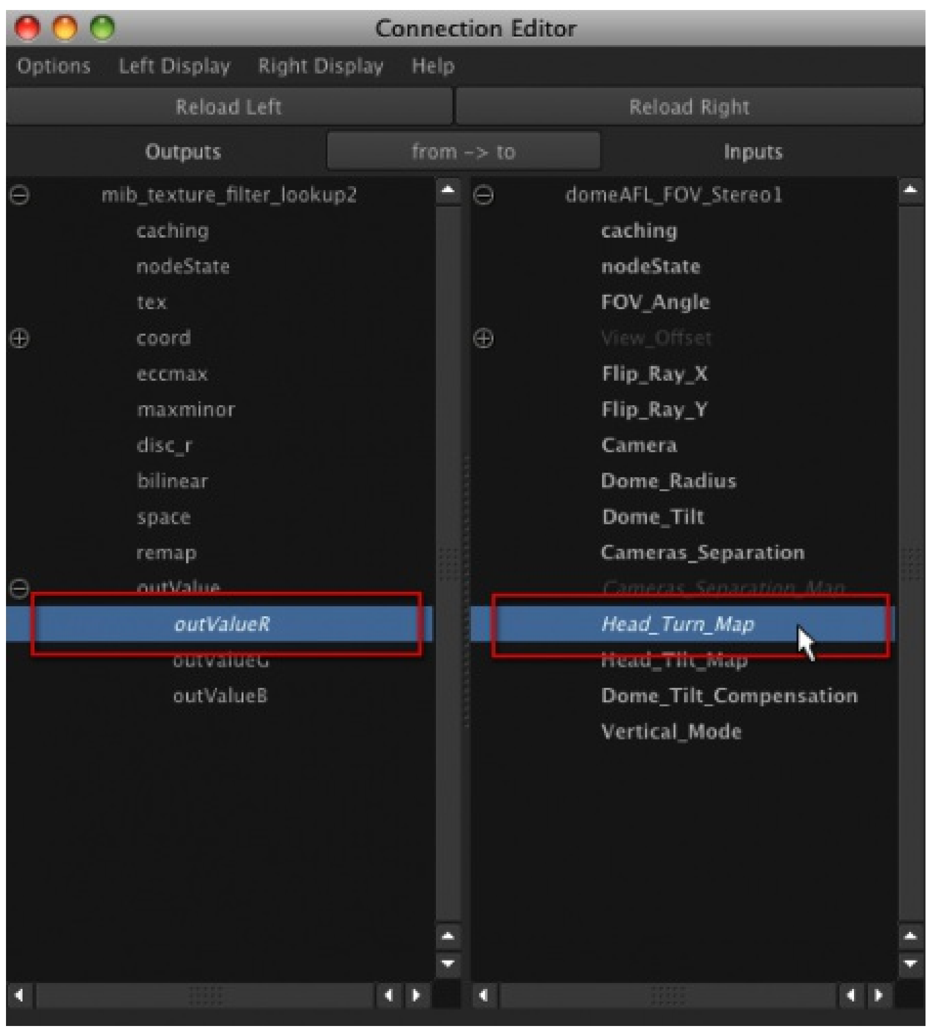


Now let's connect this shading network to the domeAFL_FOV_Stereo node. Using the middle mouse button drag the head turn map's **mib_texture_filter_lookup** node onto the **domeAFL_FOV_Stereo** node. From the connect pop-up menu, select **other...**

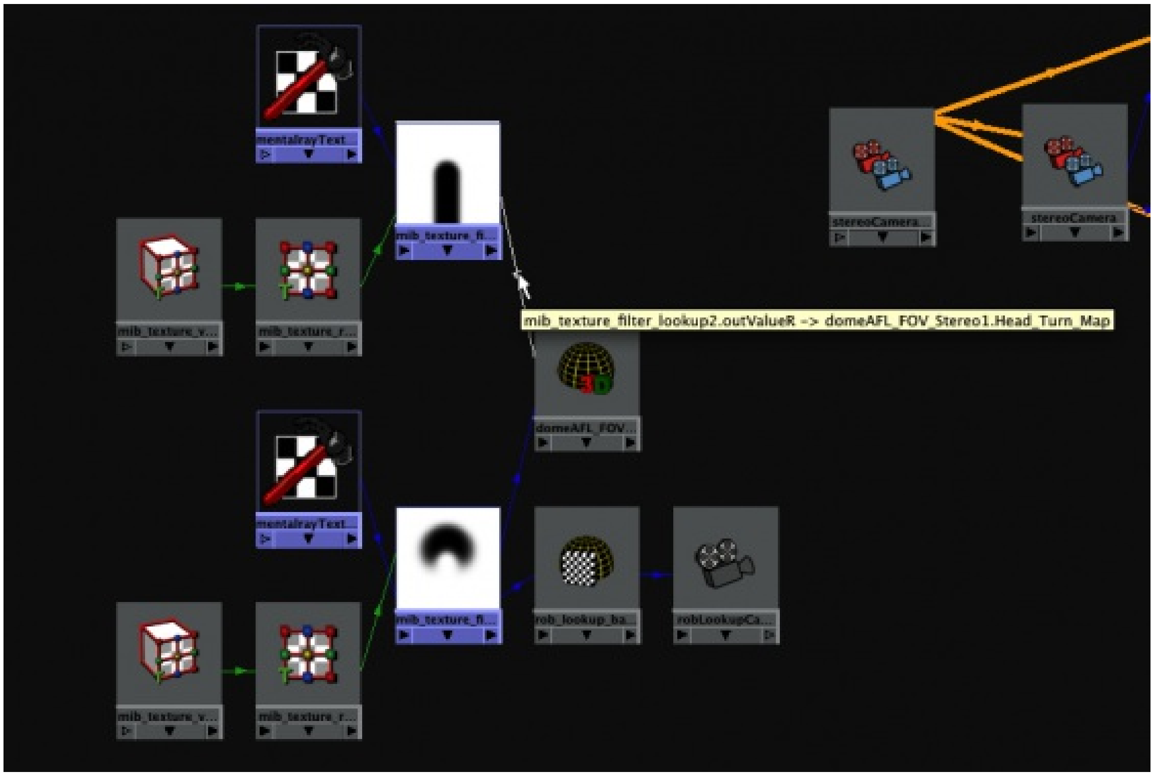
On the left side of the connection editor, expand the **outValue** attribute and select **outValueR**. On the right side of the connection editor, select **Head Turn_Map**.

Close the connection editor.

This has connected

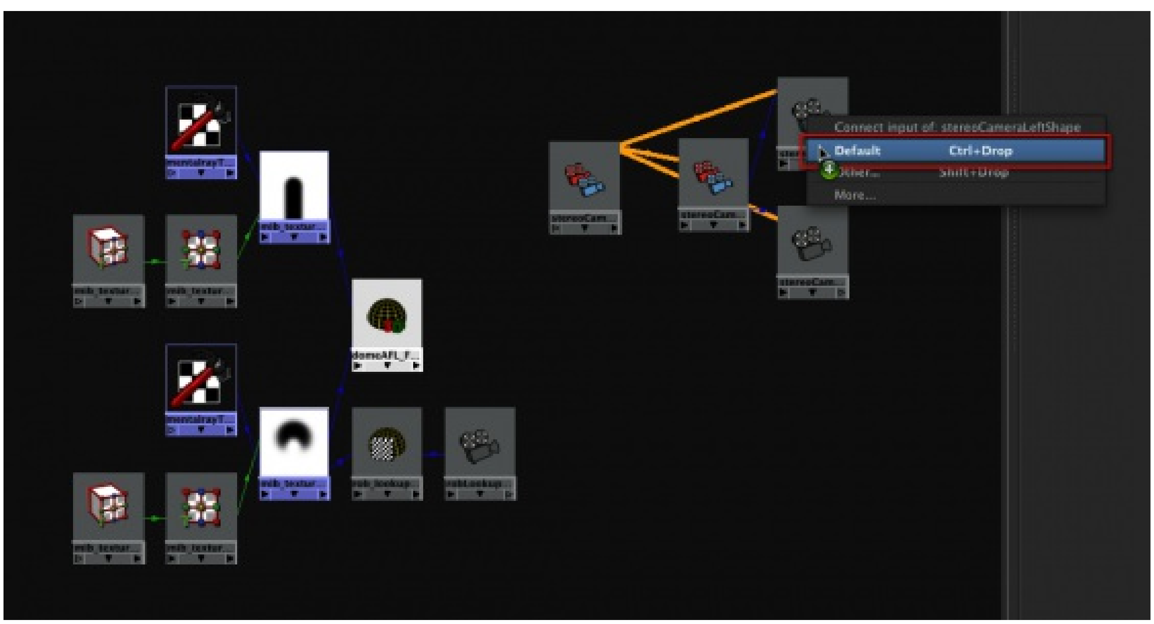


mib_texture_filter_lookup.outValueR to **domeAFL_FOV_Stereo.Head Turn_Map**.



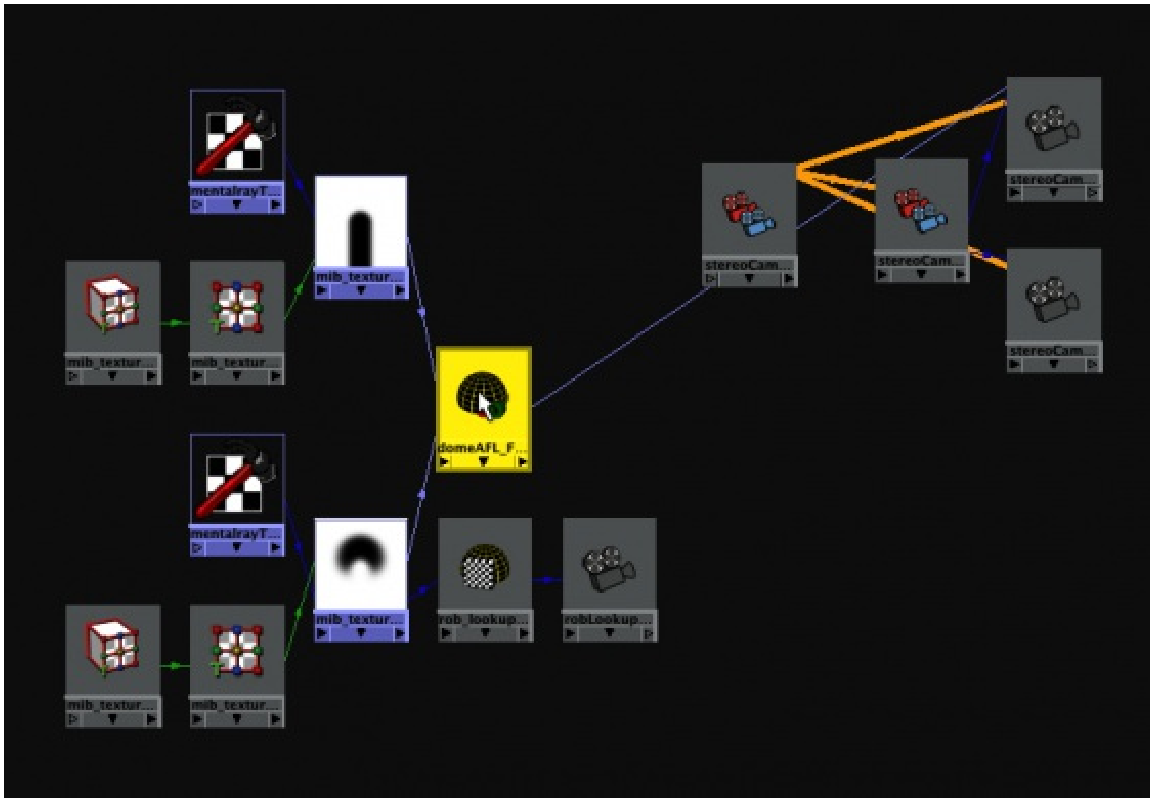
Let's clean up the view in the work area by rearranging the nodes. Click the **rearrange graph** icon in the toolbar.

Let's connect this lens shader node to the left camera in the stereo rig. Using the middle mouse button drag the **domeAFL_FOV_Stereo** node onto the **stereoCameraLeftShape** node. From the connect pop-up menu, select **default**.

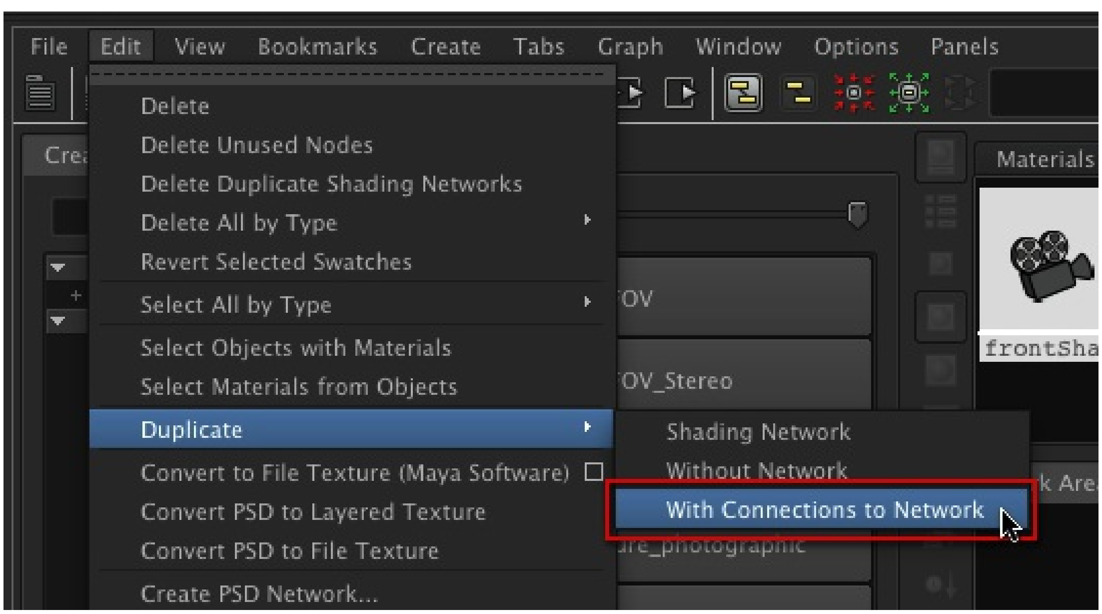


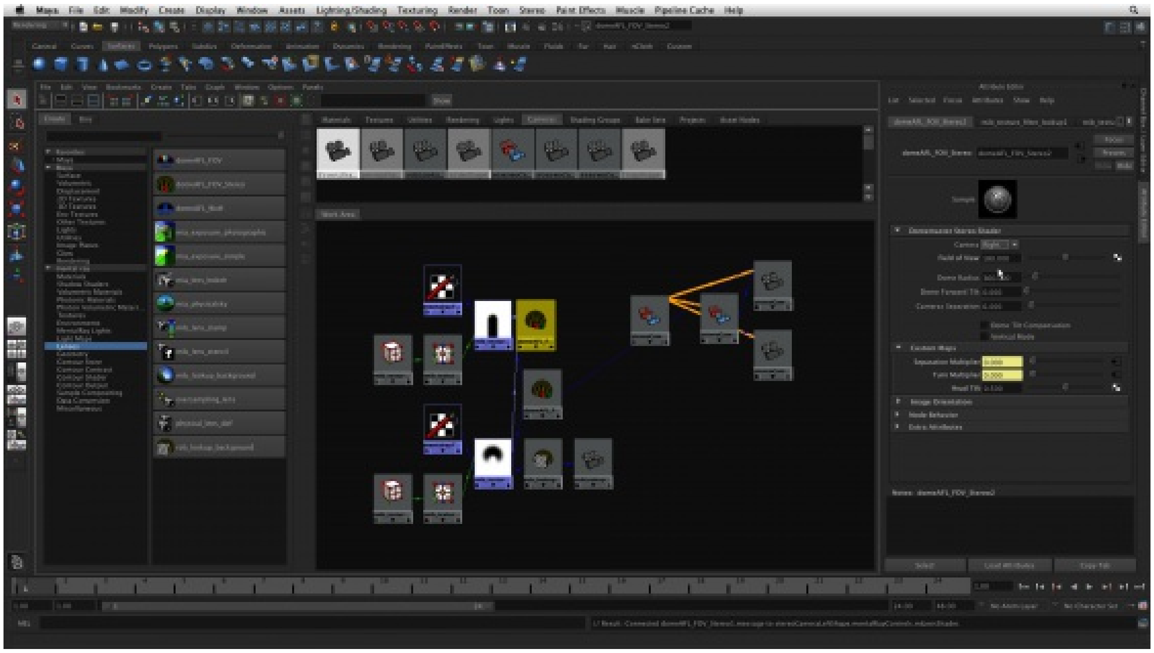
This has connected **domeAFL_FOV_Stereo.message** to **stereoCameraLeftShape.miLensShader**

Let's select the domeAFL_FOV_Stereo node and duplicate it for the right camera.



Select the **domeAFL_FOV_Stereo** node in the work area and from the Hypershade's **Edit** menu, select **Duplicate > With Connection to Network.** This has duplicated the domeAFL_FOV_Stereo node and linked it to the existing custom texture map shading network.

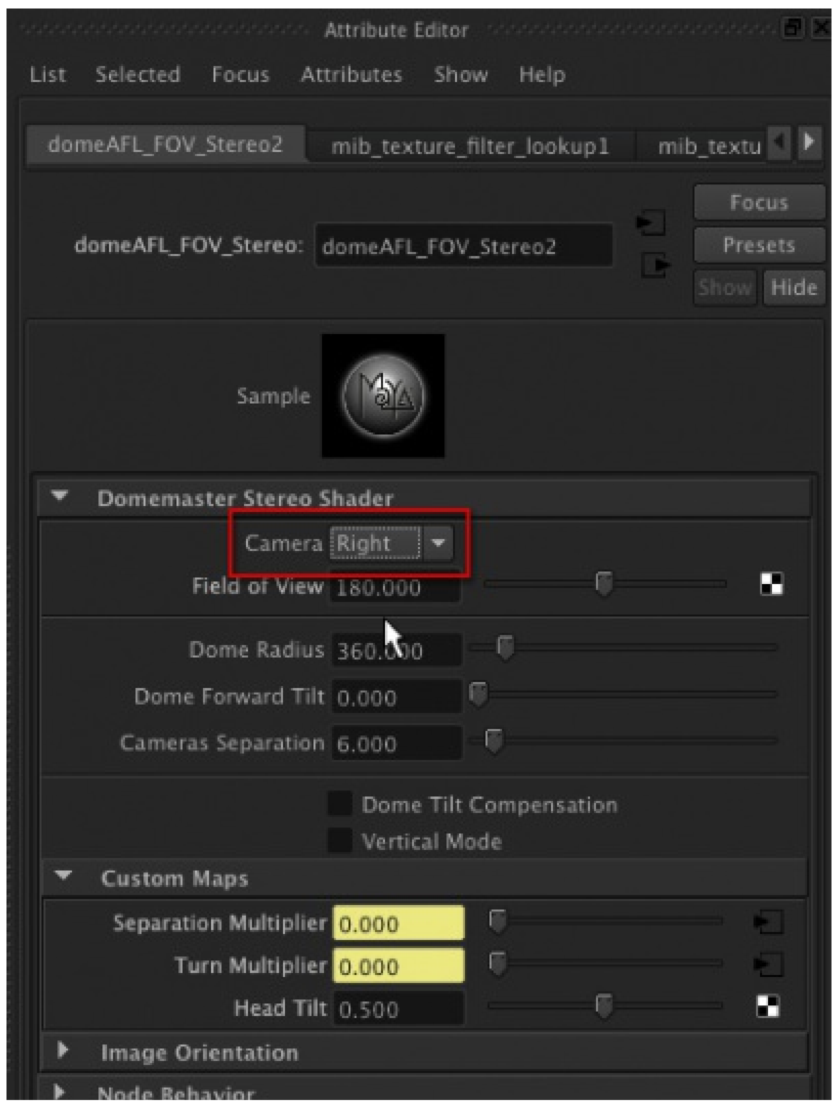




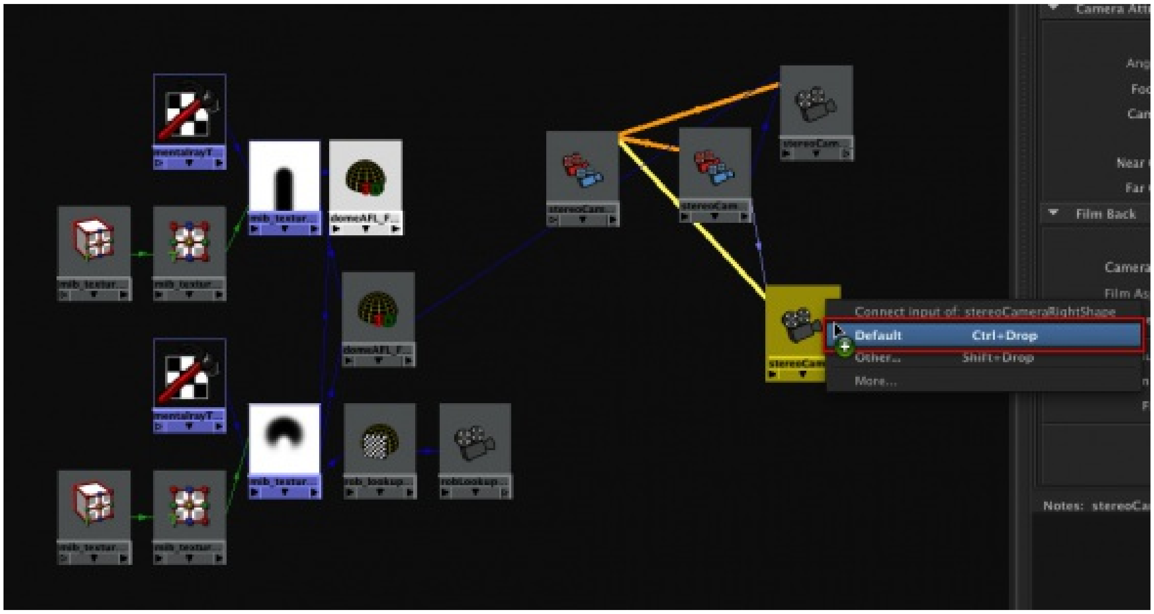
This node will be used for the right camera in the stereo rig. Click on new the **domeAFL_FOV_Stereo** node in the work area. In the attribute editor use the **Camera** pop-up menu to set the camera view to "**Right**".

Let's connect this lens shader node to the right camera in the stereo rig. Using the middle mouse button drag the new **domeAFL_FOV_Stereo** node onto the **stereoCameraRightShape** node. From the **connect** pop-up menu, select **default**.

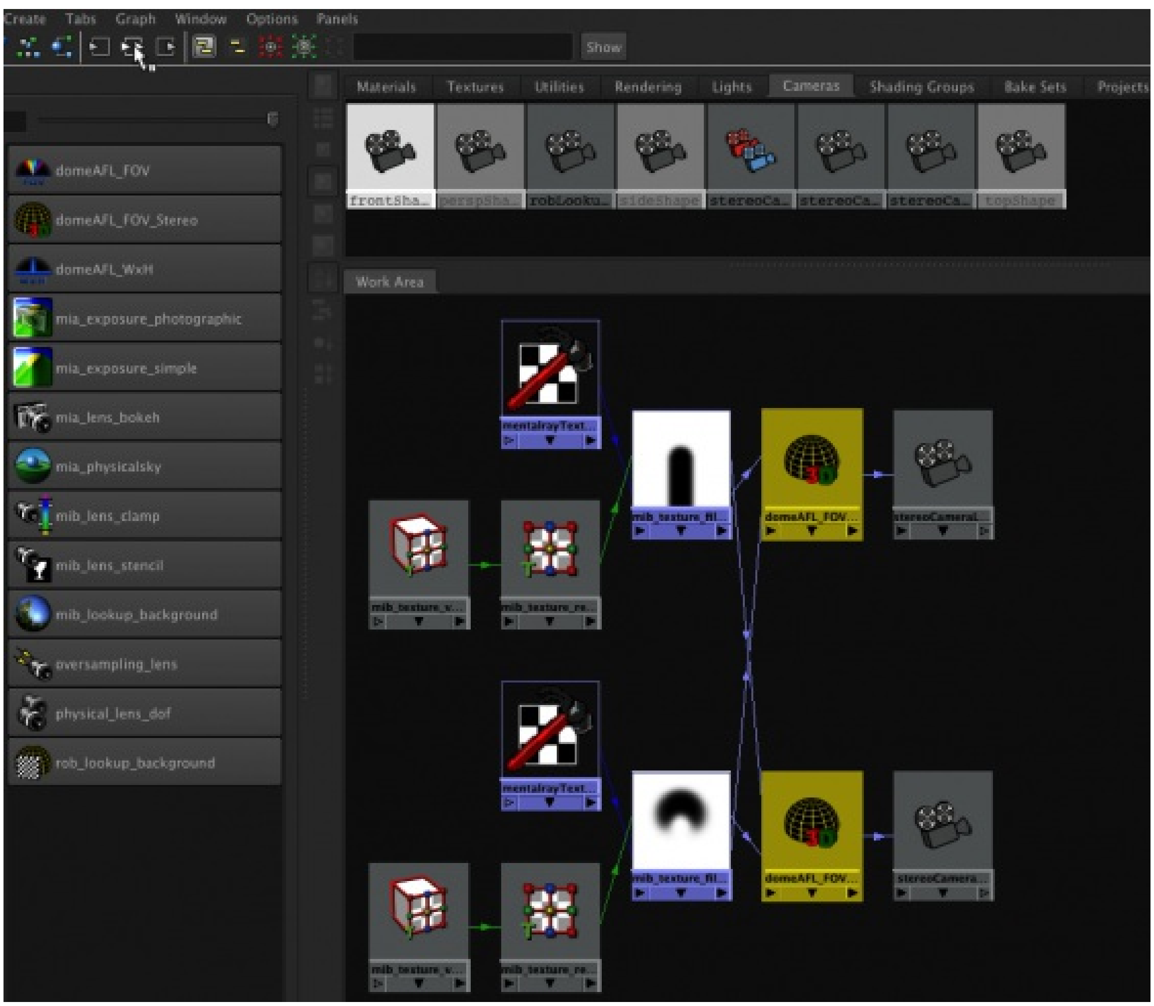
This has connected **domeAFL_FOV_Stereo.message** to



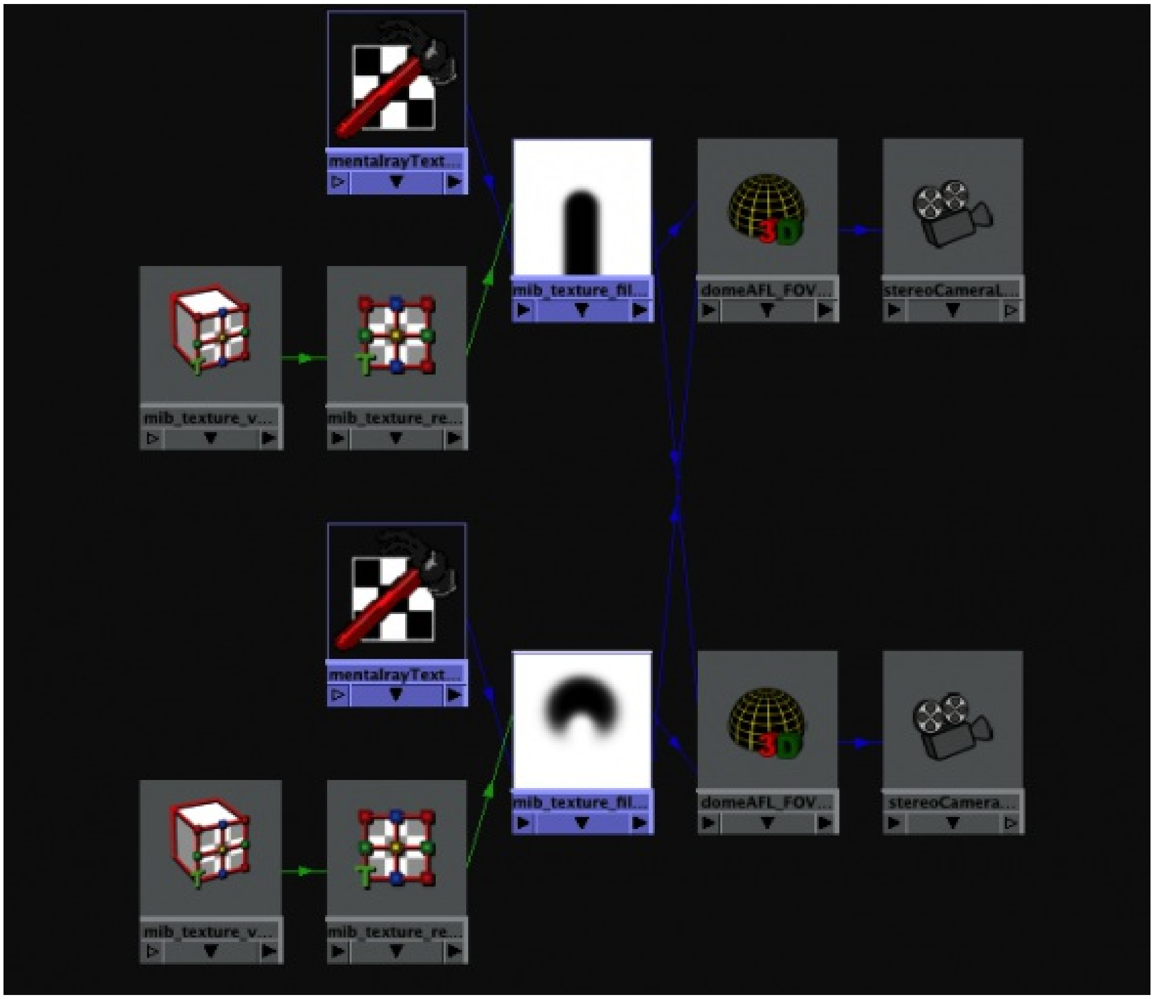
stereoCameraRightShape.miLensShader



Select the two domeAFL_FOV stereo nodes in the work area. Click the input and output connections icon in the Hypershade toolbar to regraph the scene.



This is the completed fulldome stereo camera rig with shared texture connections.



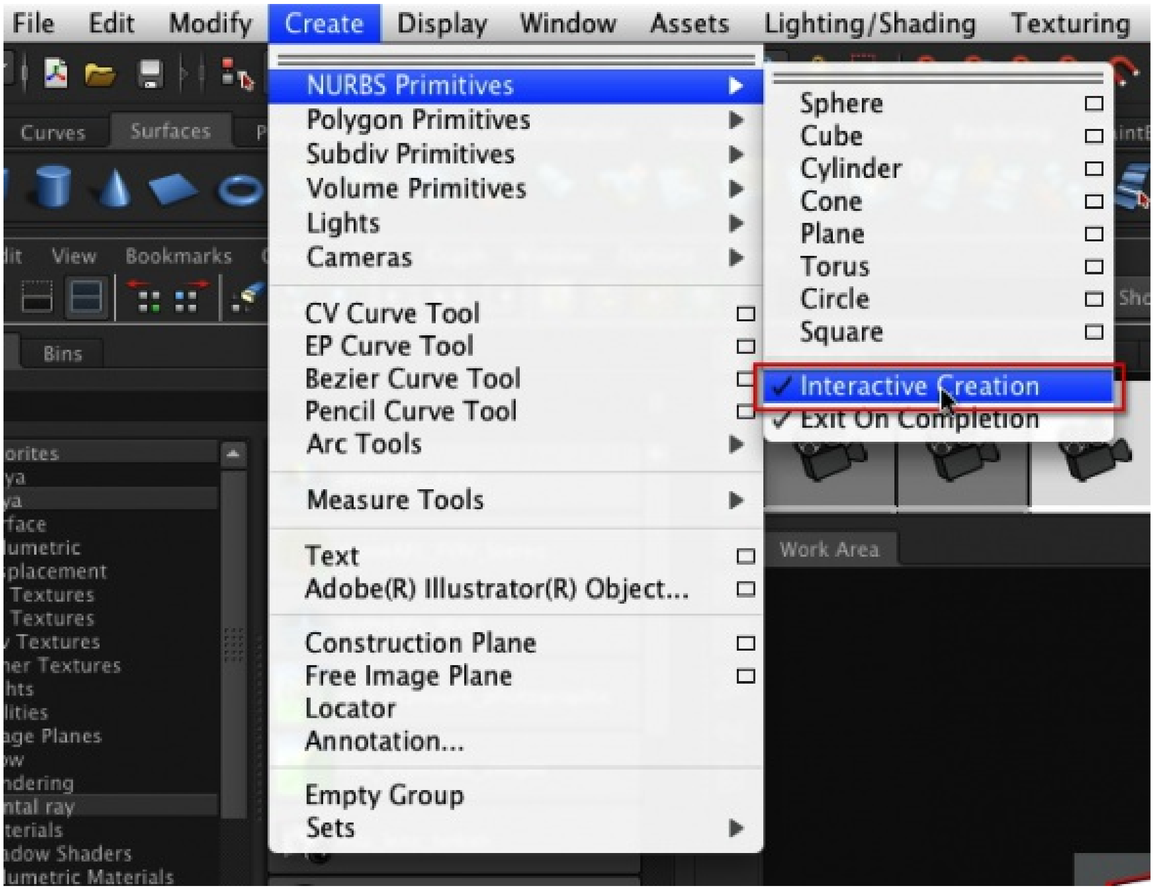
Step 4. Rendering a Domemaster Stereo Anaglyph Preview in the Maya Render View

In this step we are going to add a cube to the scene and render it as a stereoscopic domemaster image.

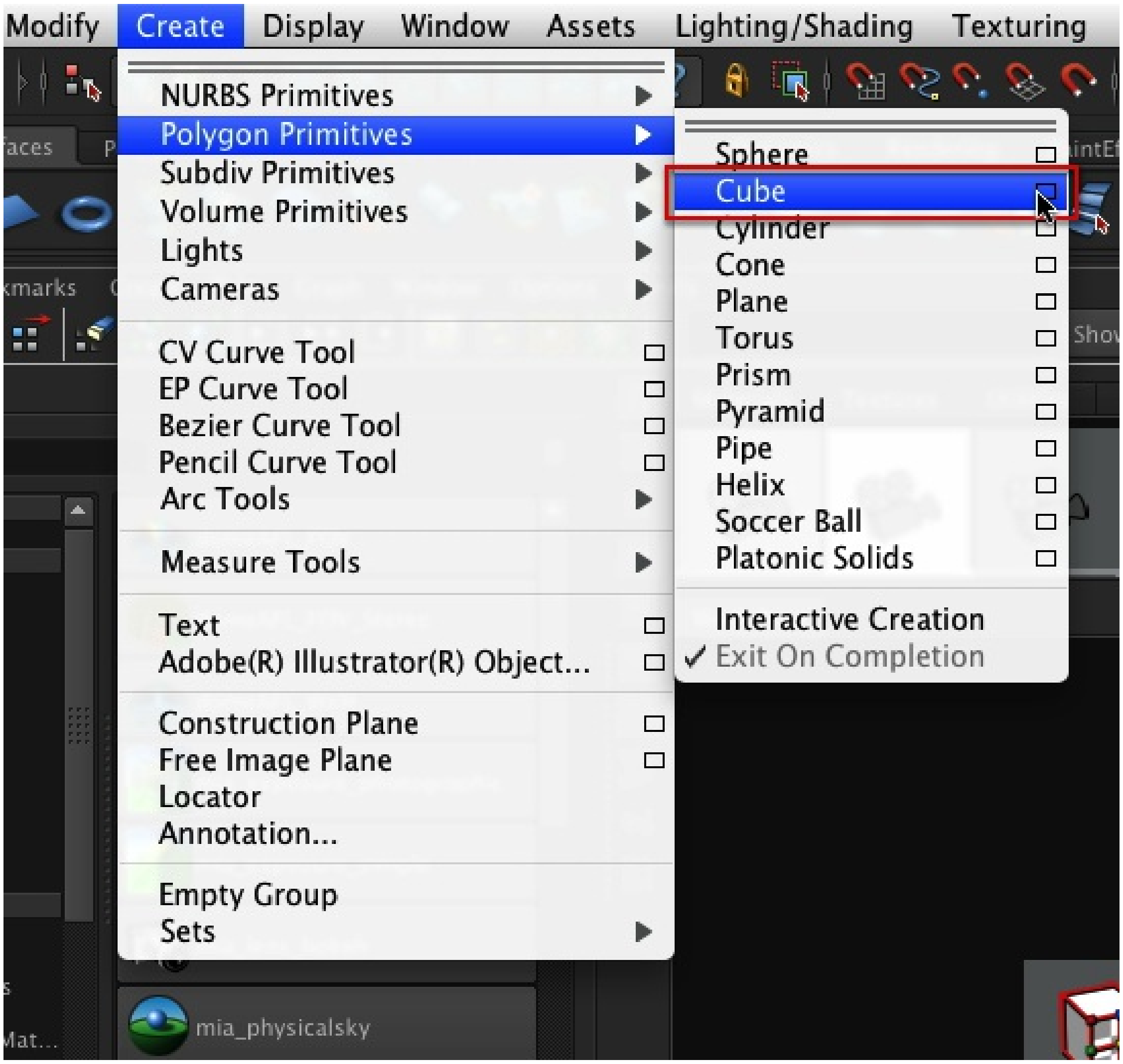
Switch back to the Hypershade / Perspective / Render layout by tapping the spacebar over the work area.

Let's add a polygon cube to the scene as a test object. We need to start by disabling interactive creation so we can specify the exact size of the polygon cube.

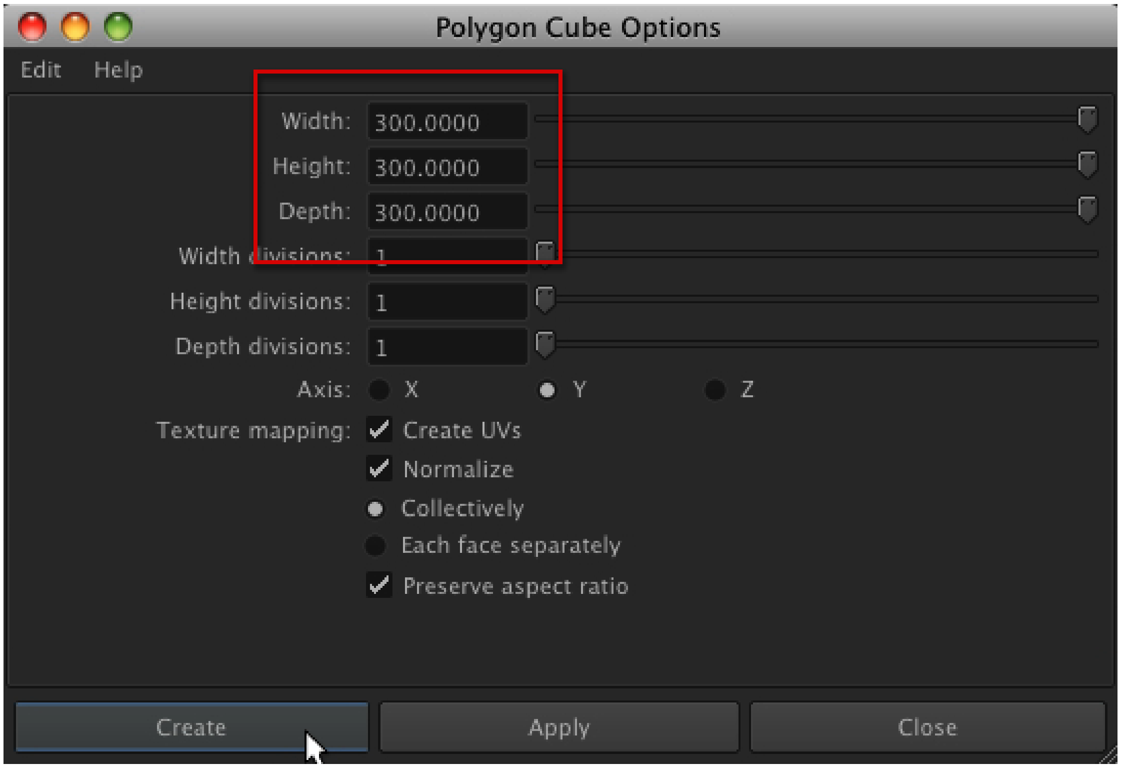
From the **Create** menu select **Polygon Primitives >Interactive Creation**. Now we can create an accurately sized polygon cube.



From the **Create** menu select **Polygon Primitives > Cube with options**.

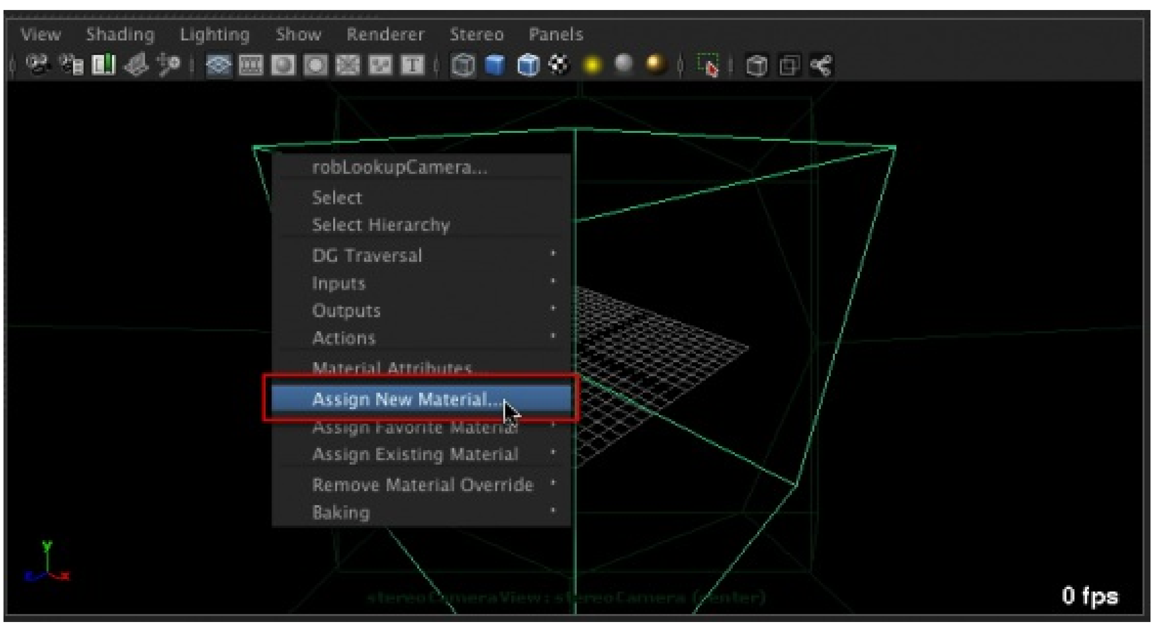


In the polygon cube options window set the **width** and **height** and **depth** to **300 units**. Click the Create button.



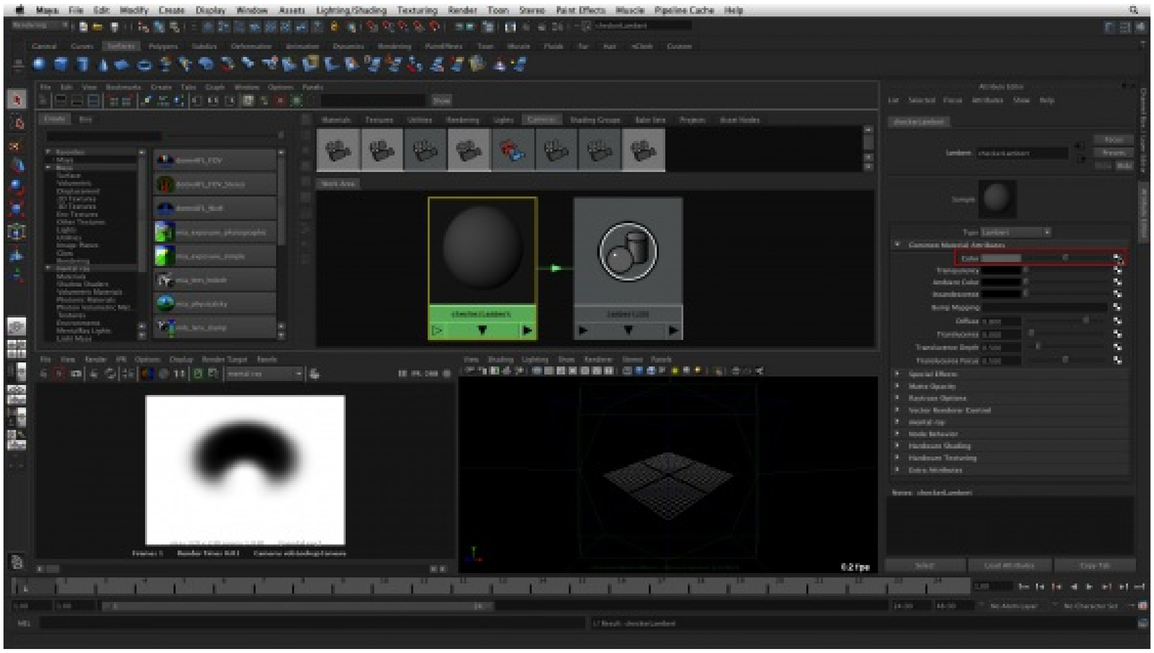
Let's attach a texture to the cube. Right-click in the perspective view, and from the marking menu select **Assign New Material...**

In the Assign New Materials window, select the **Lambert** material. We now have a Lambert surface material applied to the polygon cube.



In the attribute editor rename the material to **checkerLambert**.

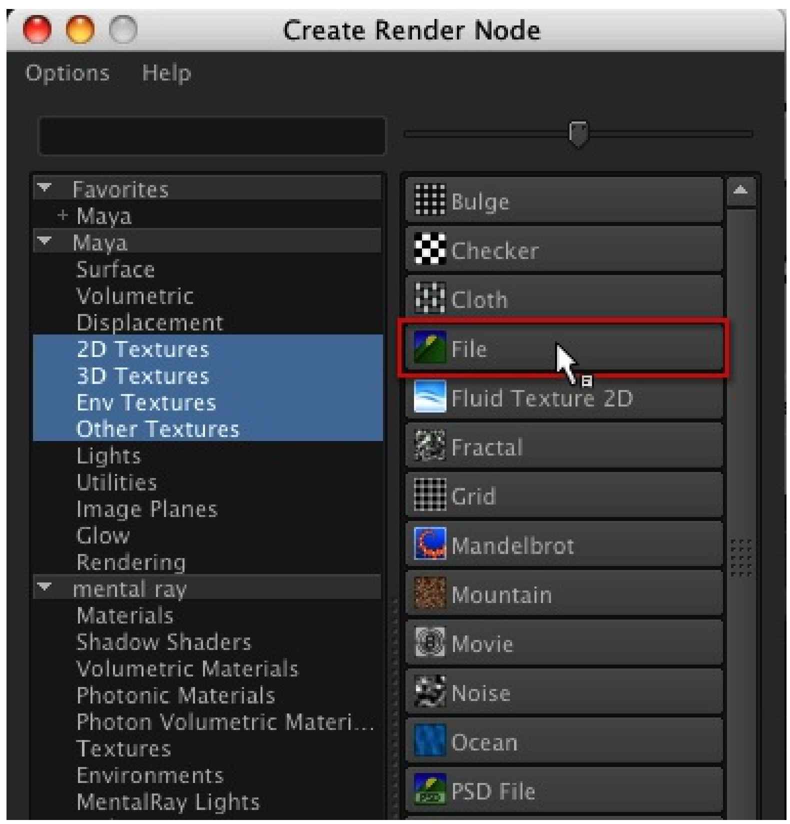
Let's connect the PNG file texture. In the attribute editor click on the map icon next to the color attribute.

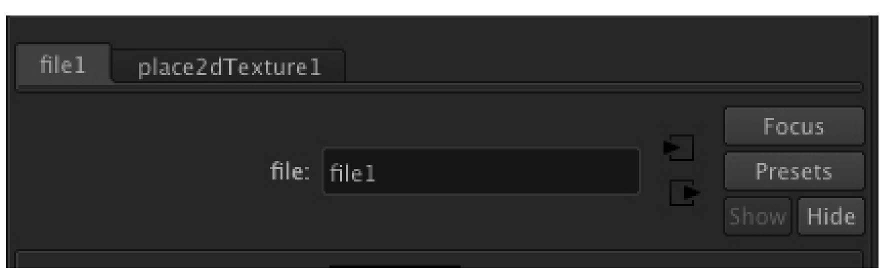


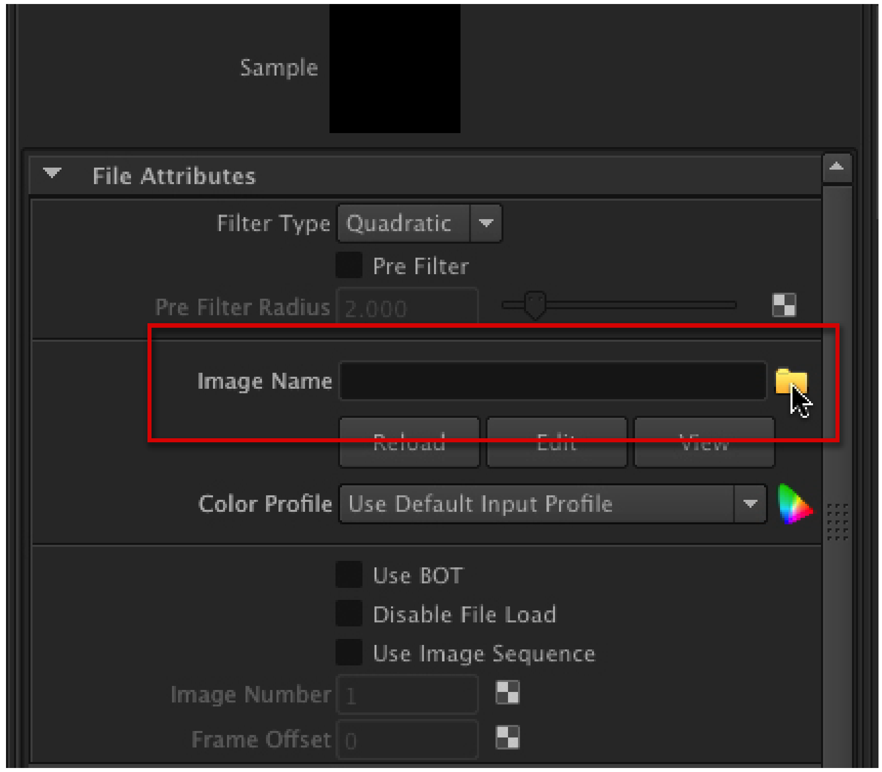
In the **Create Render Node** window, select the **File** node. A file node has been added to the shading network.

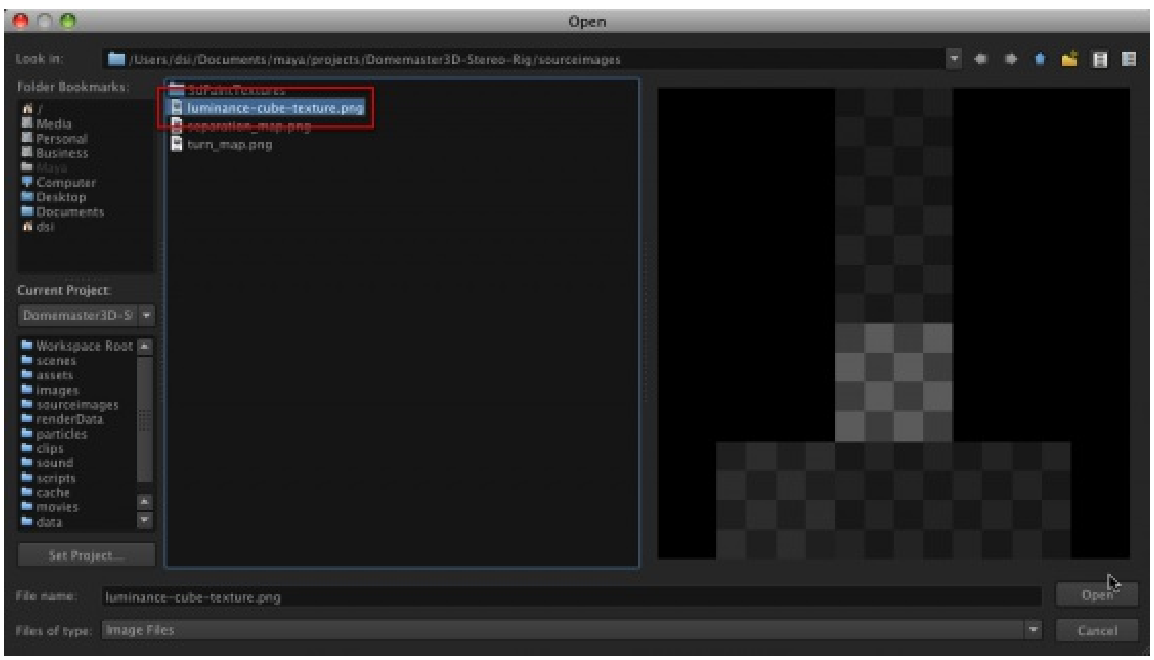
Let's add a PNG texture to the file node using the attribute editor. Click on the folder icon next to the image name field.

In the open dialog, select **luminance-cube-texture.png** and click open.

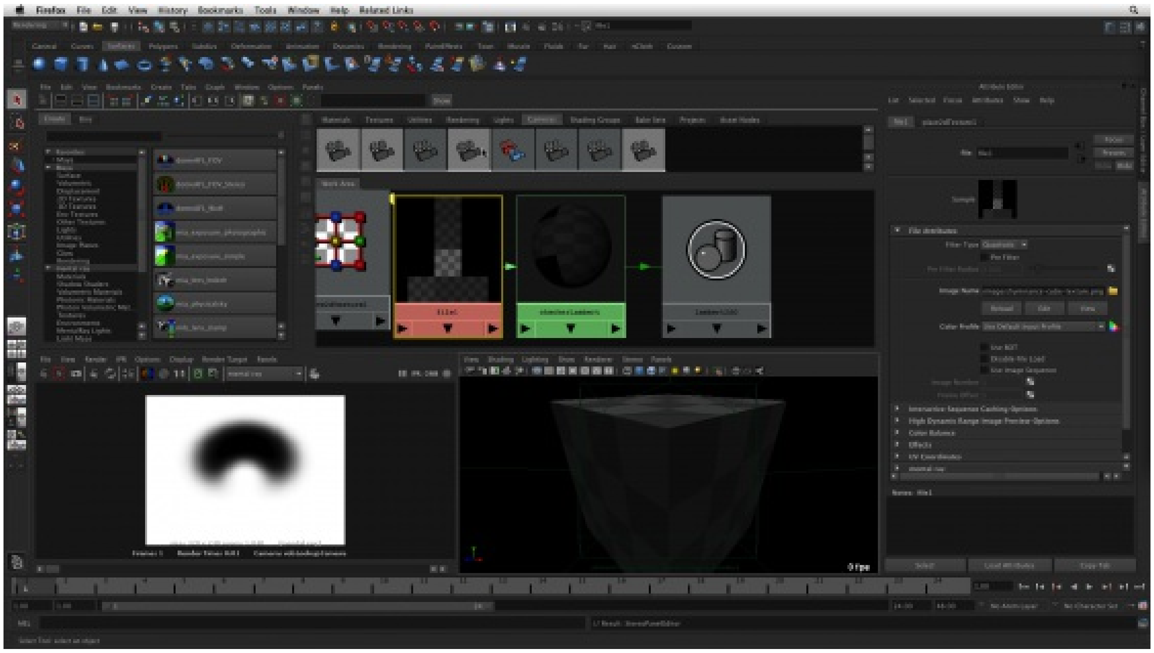




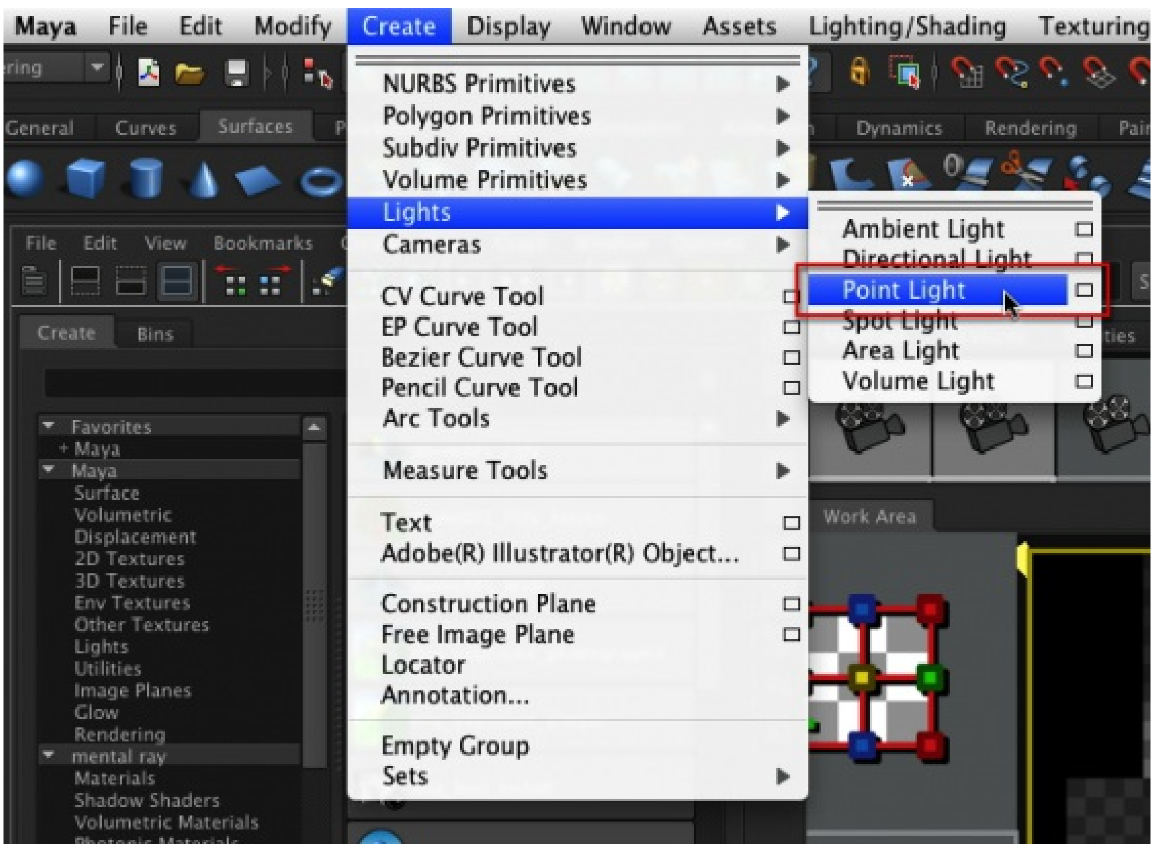




Press the 6 key to switch to smooth shaded mode.

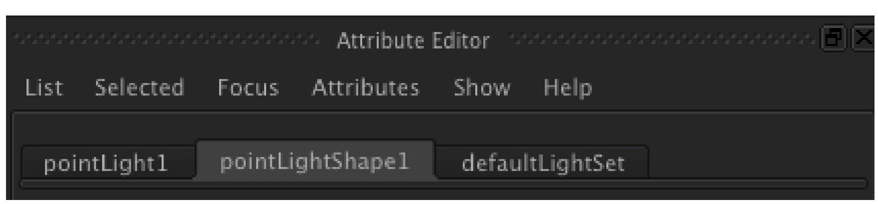


We need to add a light to scene. From the **Create** menu, select **Lights > Point Light**.

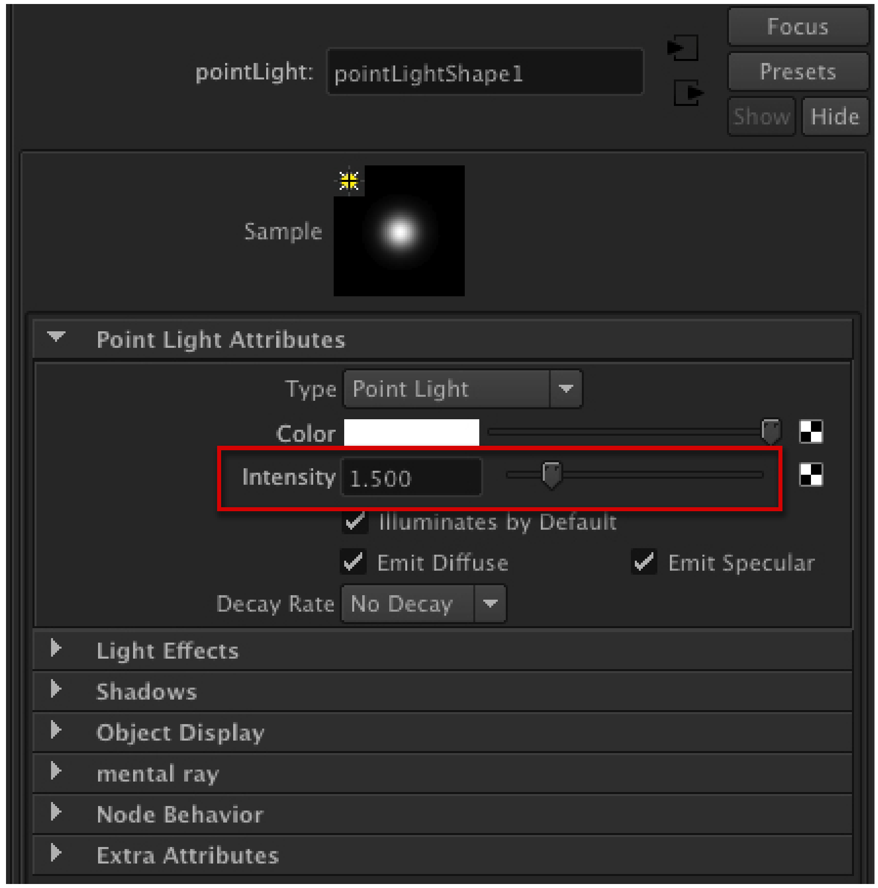


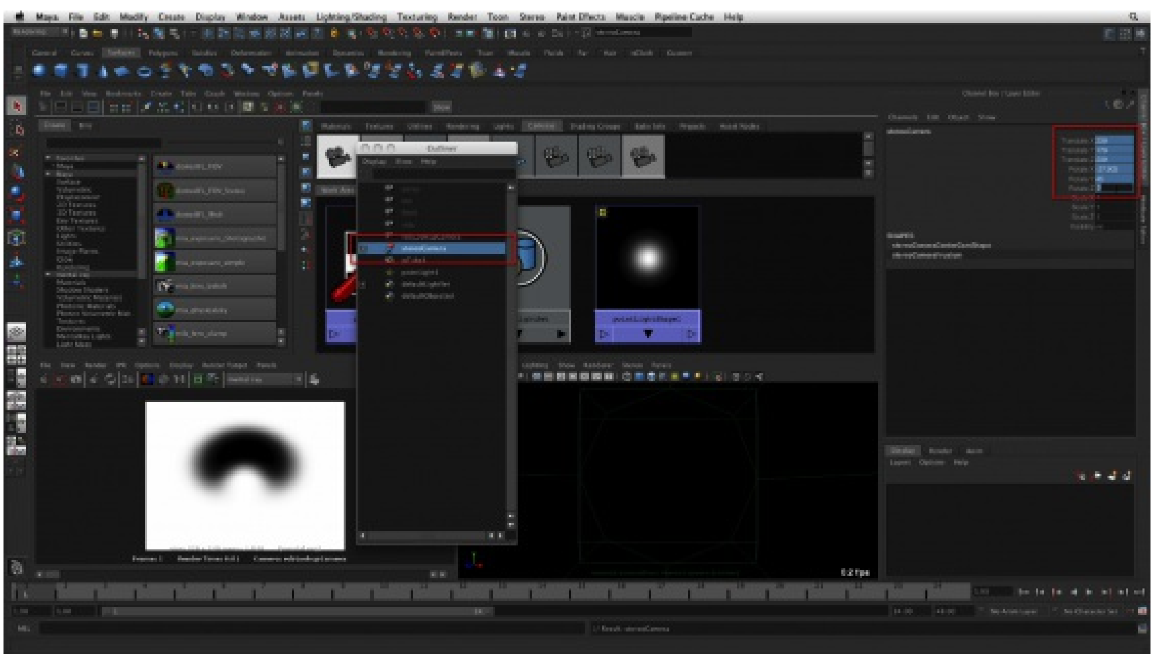
In the Attribute editor set the Point Light's intensity to 1.5 and press enter.

In the perspective viewport let's enable the light. From the Lighting menu select **Use All Lights**.



We need to reposition the stereoCamera before we render the scene. Open the **outliner** and select the **stereoCamera**.

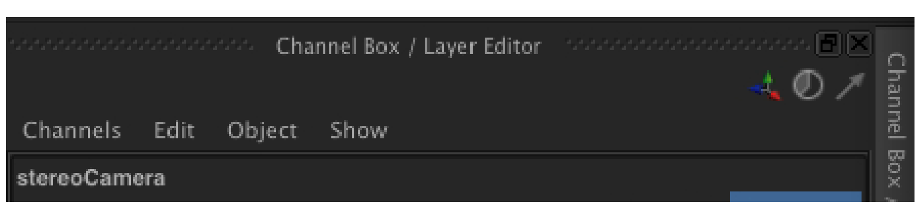




In the channel box set the camera's translation and rotation values to 0.0. You can now close the outliner.

Before we render the scene we need to go over the render settings.

Click the **render settings** icon in the toolbar. Make sure the mental

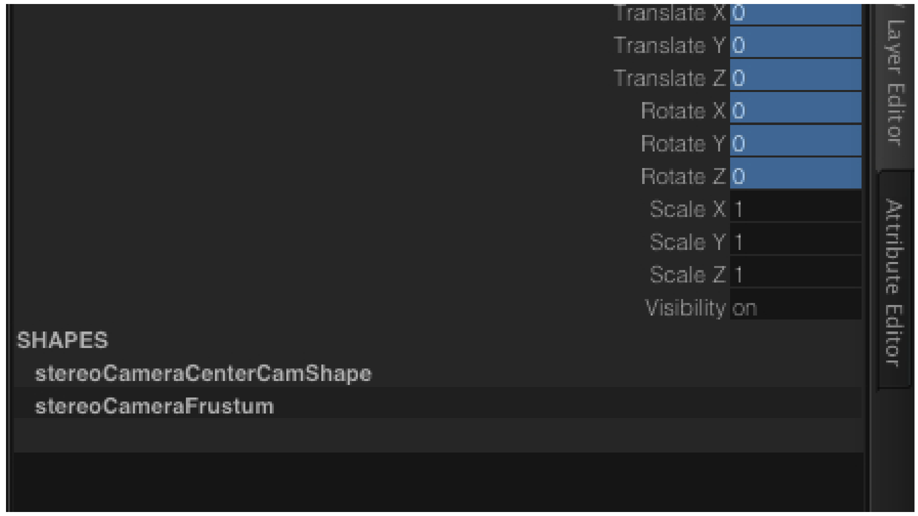


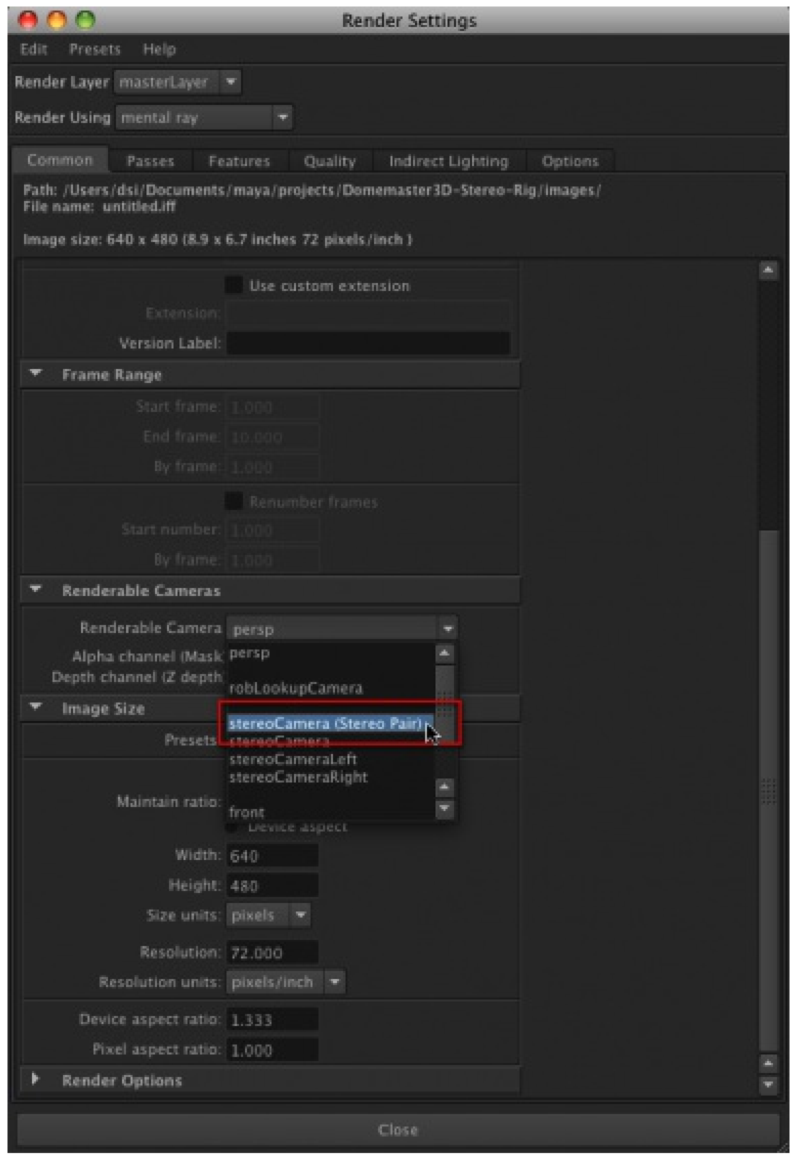
ray renderer is selected. Scroll down in the **common** tab of the render settings window. In the Renderable Camera's section make sure the **Renderable Camera** popup menu is set to **stereoCamera (Stereo Pair)**.

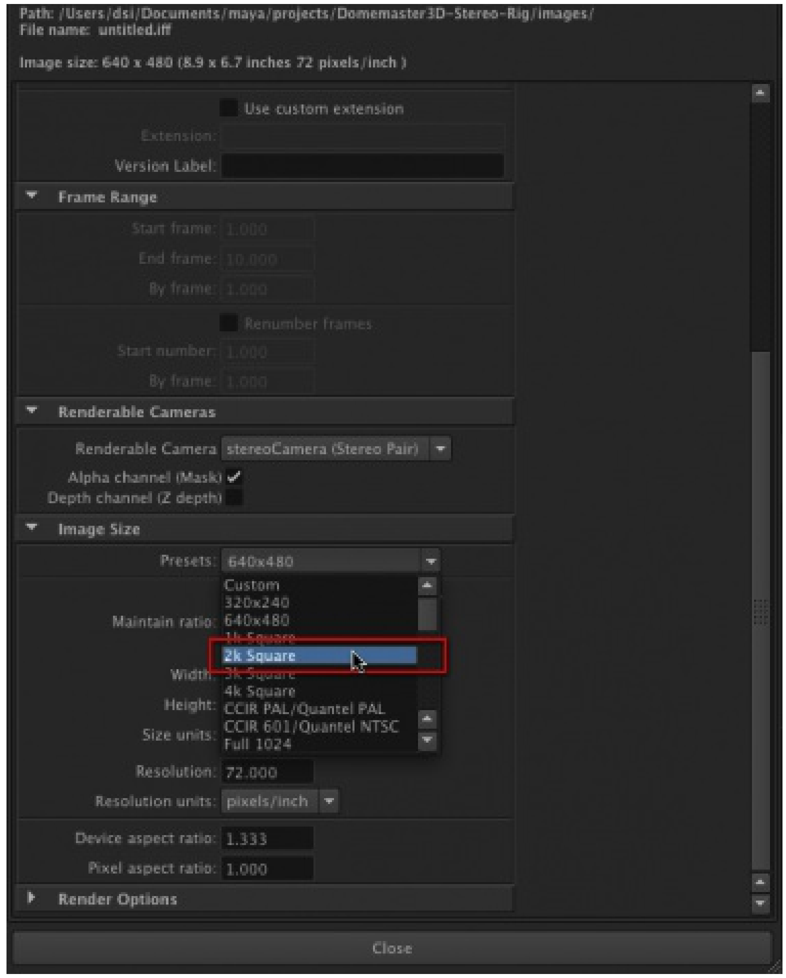
When you batch render the sequence Maya will automatically create two folders in the images directory - one for the left camera images and one for the right camera images. Each of the frames in your animation will result in a right and left image rendered to the appropriate folder.

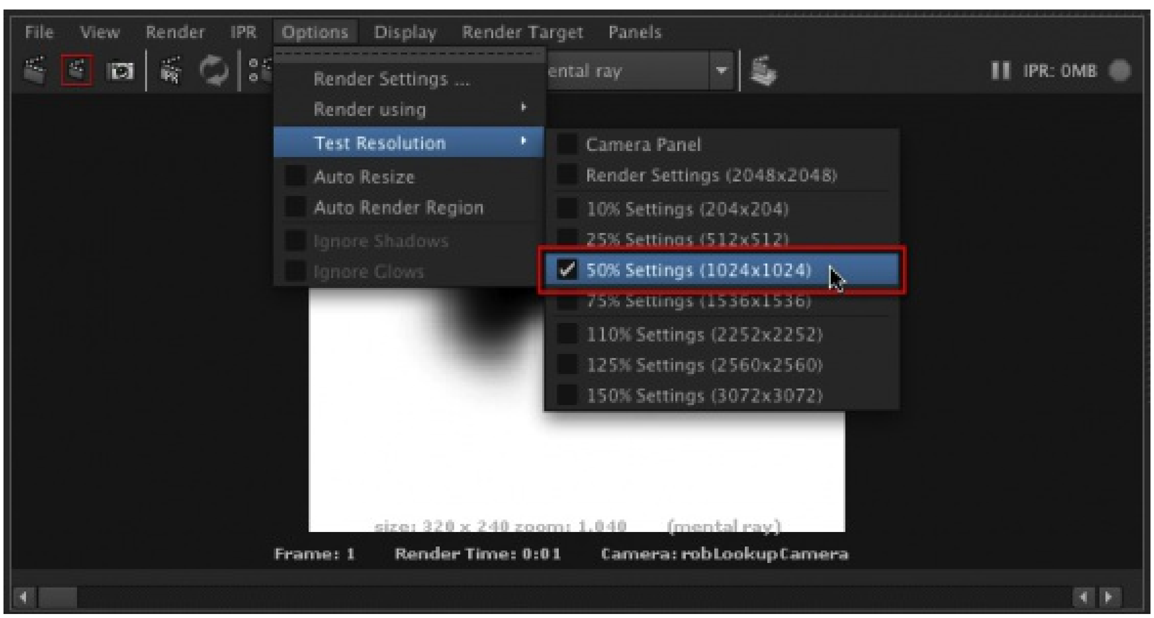
Let's set the image size to a 2K resolution output (2048 x 2048) with a square 1:1 aspect ratio for our test render. In the **Image Size** section choose the **2K Square** preset. Close the render settings window

To speed of the performance of the render view, lets use the 50% resolution setting. In the render view **Options** menu, select **Test Resolution > 50% settings (1024x1024)**.

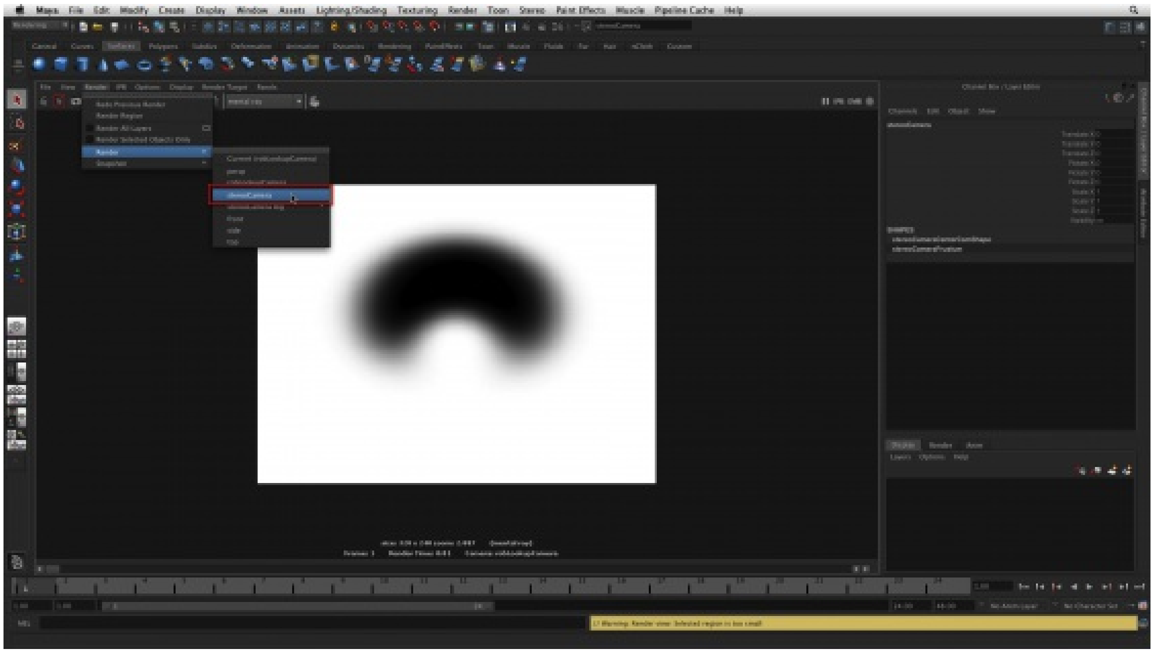




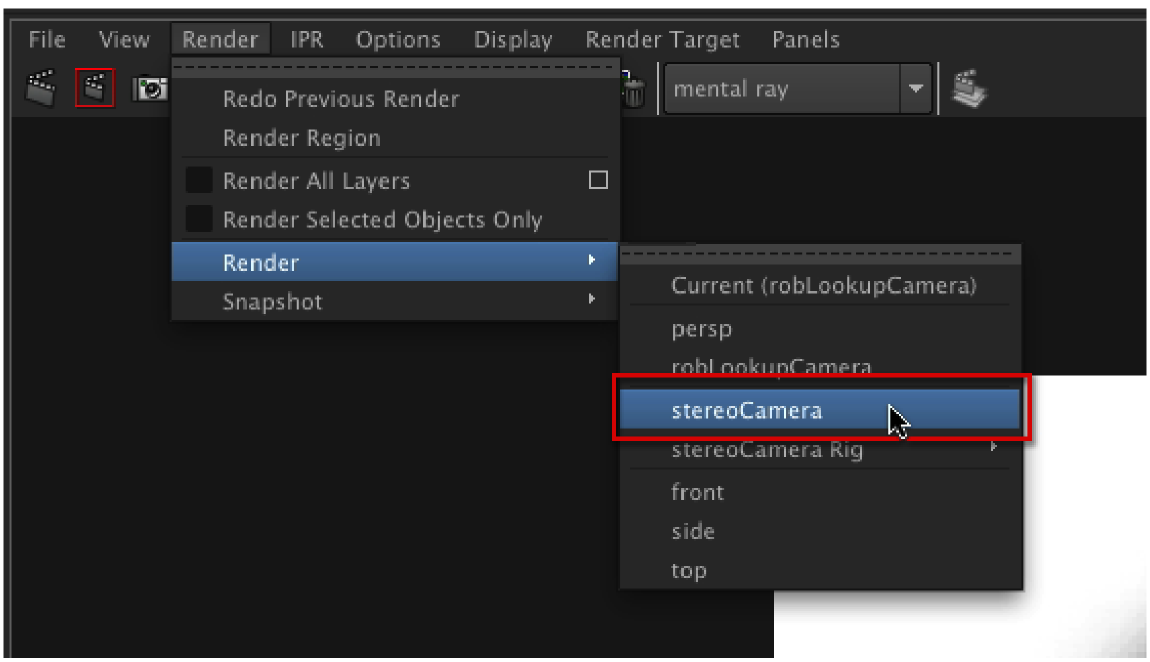


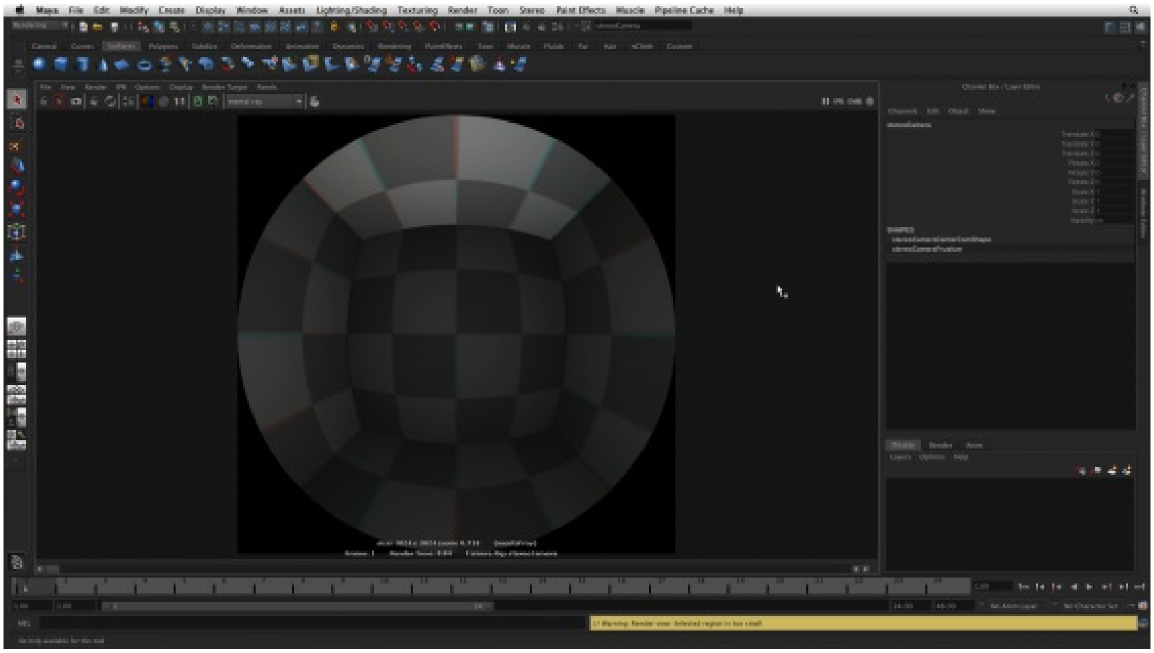


Let's maximize the render view. Click in the render view and tap the space bar to go full-screen.

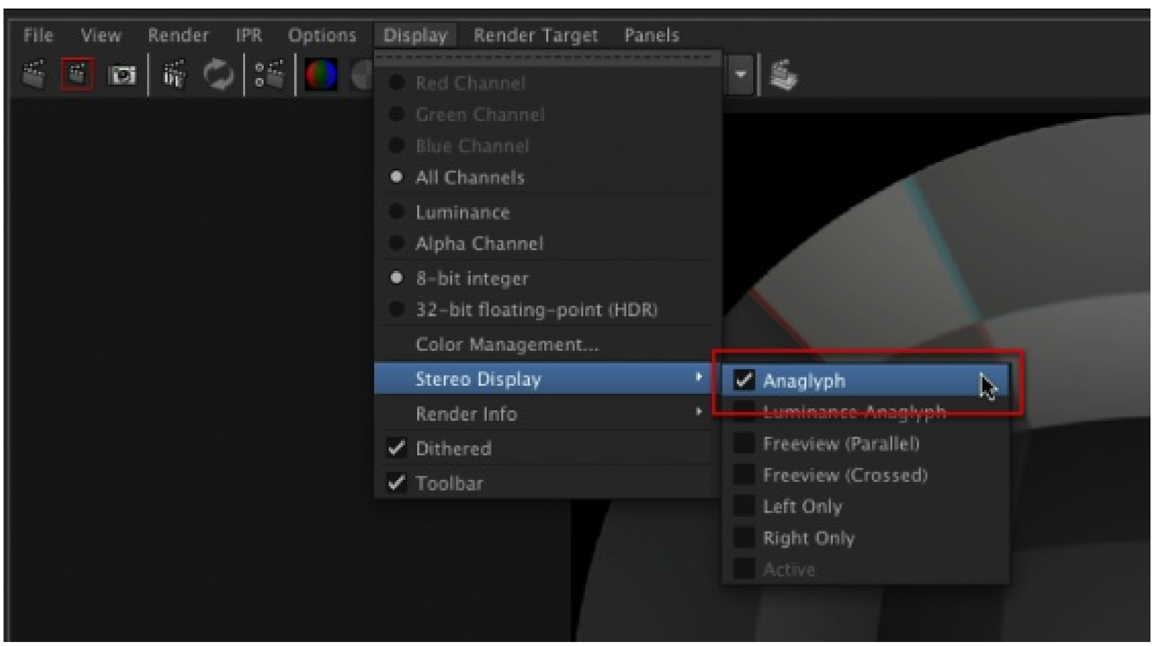


We are now ready to render the stereo camera. In the render view from the **Render** menu select **Render > Stereo Camera**. This will automatically render the left camera view then the right camera view. The resulting images will be composited together to give an anaglyph stereoscopic preview.

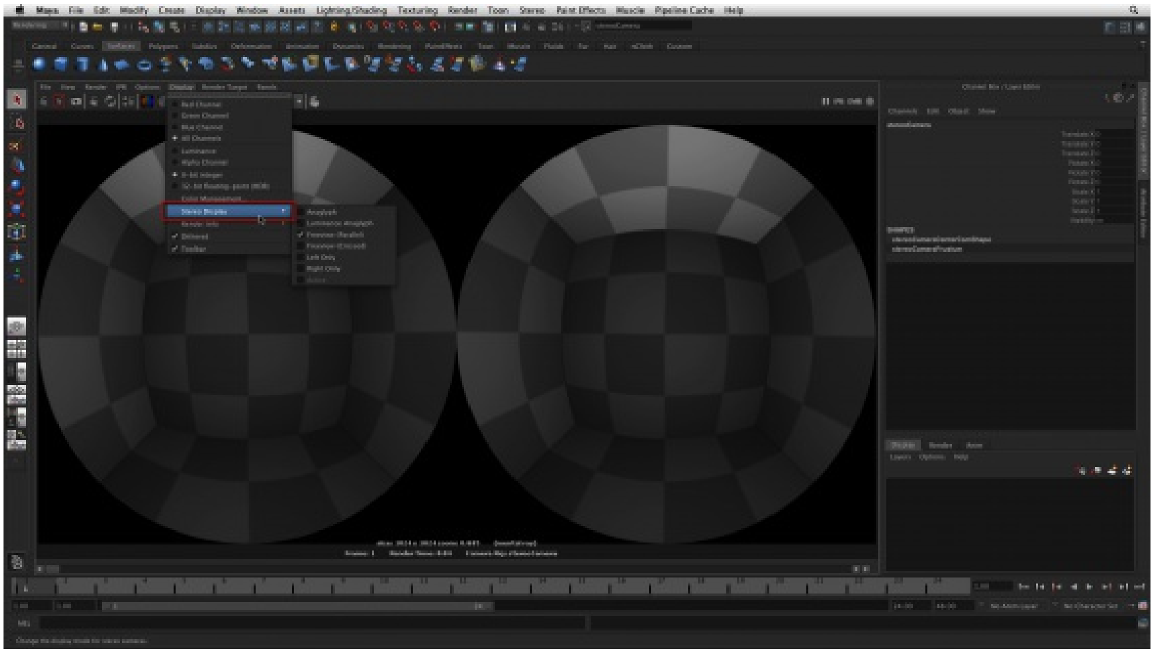




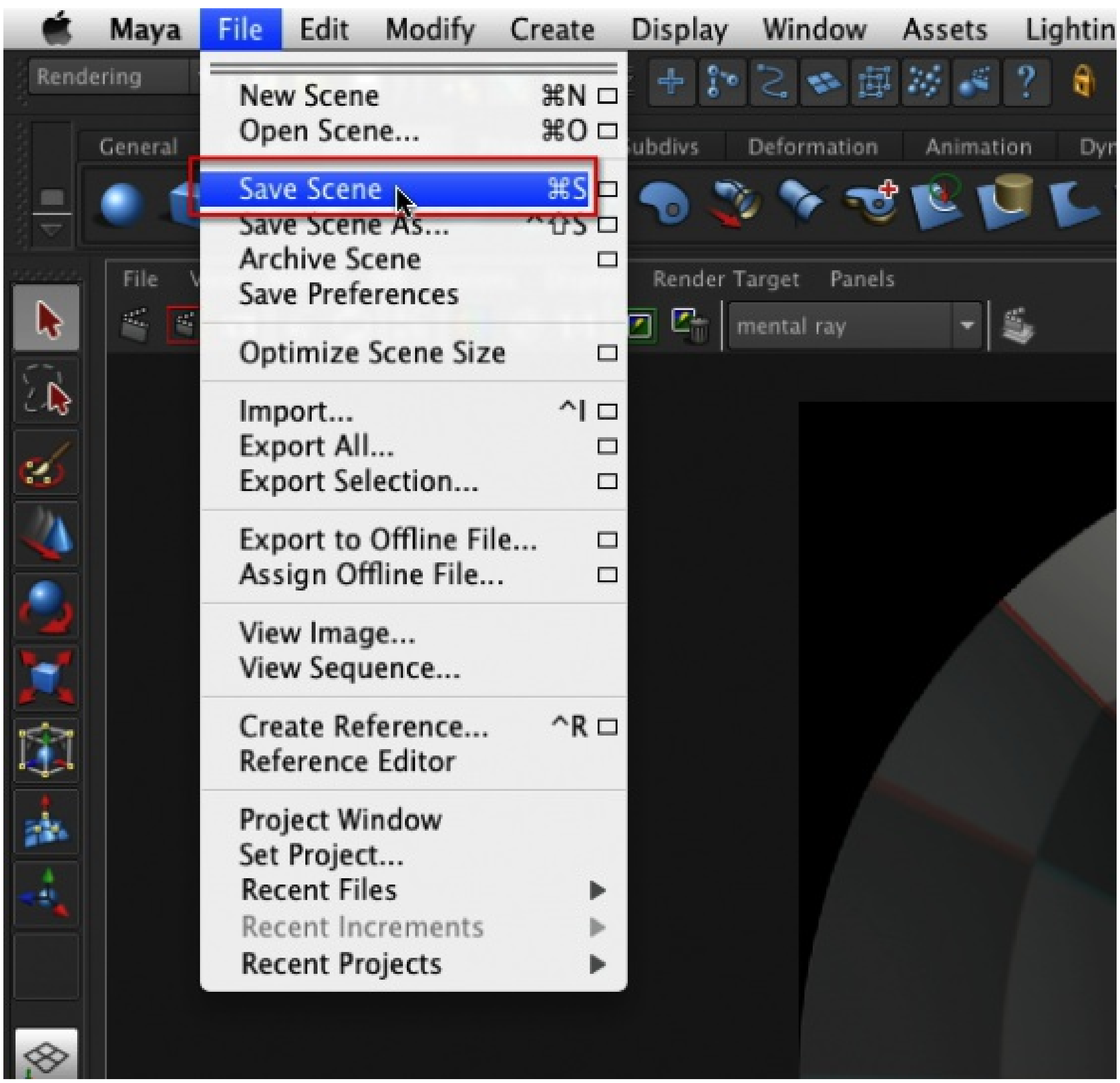
Once the render is complete you can choose a stereoscopic display method for the preview. From the **Display** menu select the **Stereo Display** menu. You can choose between the following stereoscopic formats: anaglyph, luminance anaglyph, freeview parallel, freeview crossed, left only or right only.

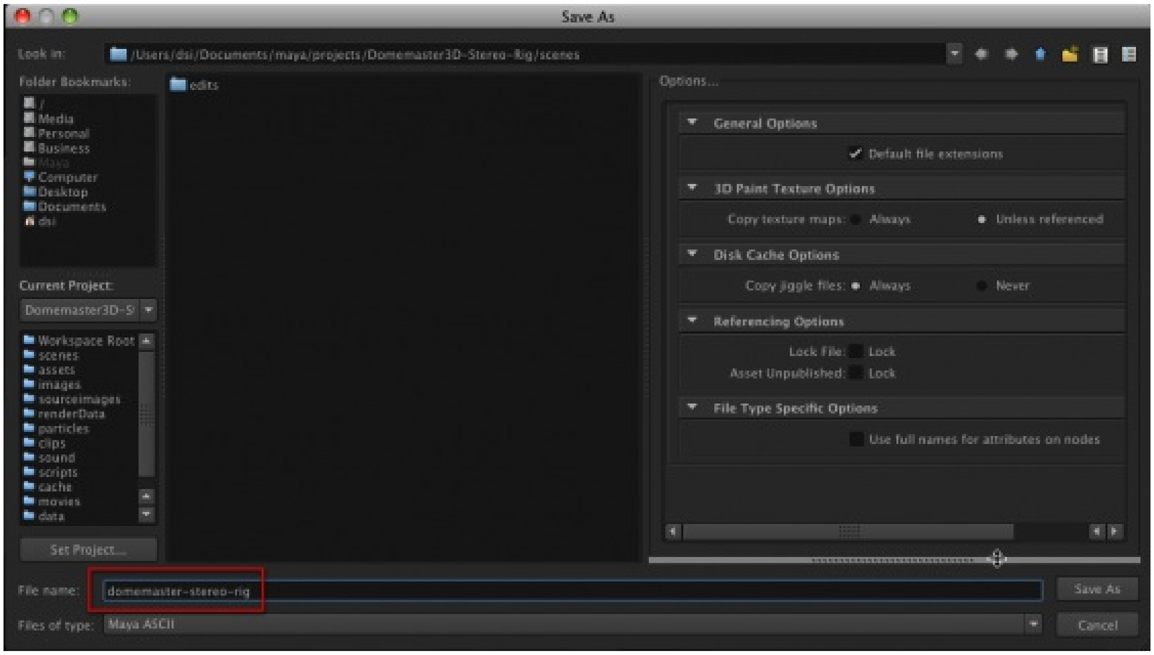


This is an image showing the stereoscopic parallel freeview display mode.



Let's save the scene. From the **File** menu select **Save scene**.



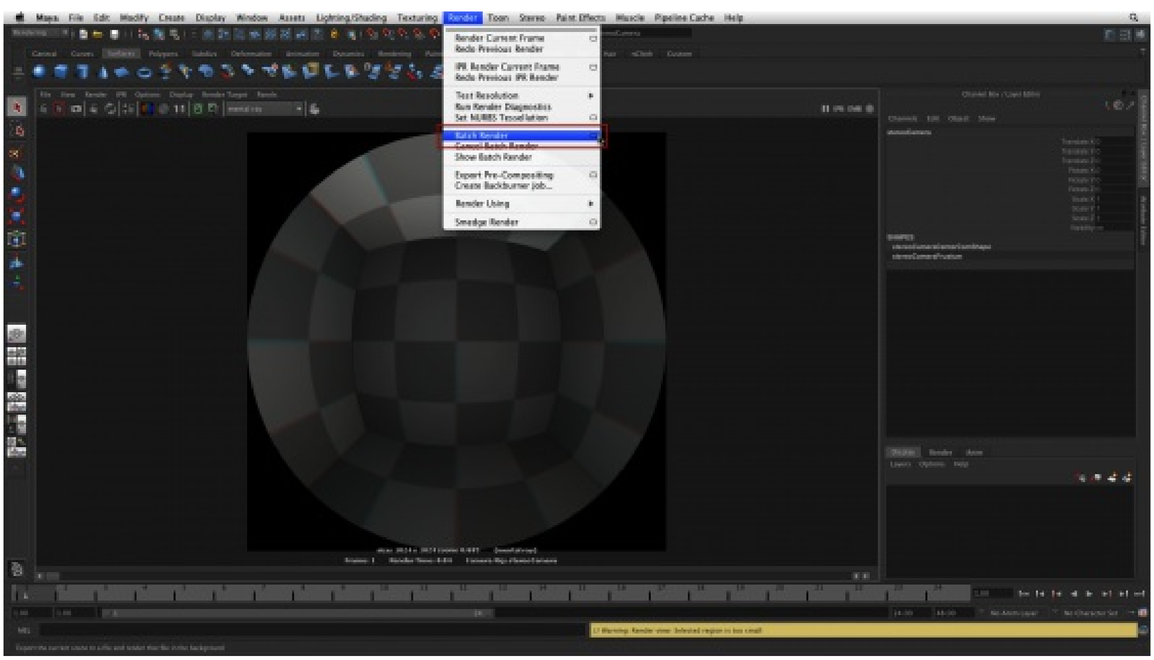


Batch Rendering

The stereo camera rig allows you to render stereoscopic domemaster image sequences using Maya's Batch Render command. If you want to render an animation set the output to the name.number.extension format in the render settings window.

Switch to the Rendering menu set.

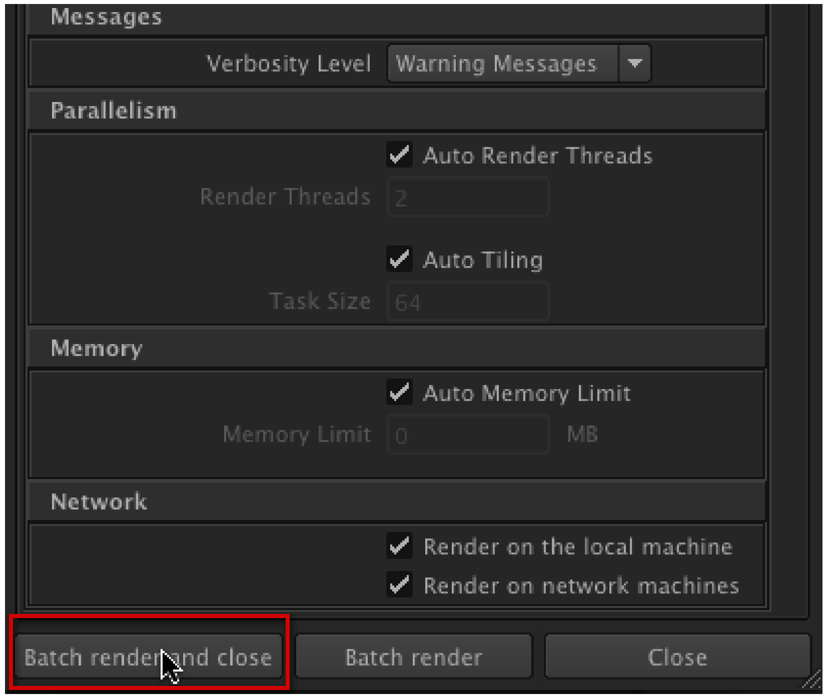
From the **Render** menu select **Batch Render with options**.

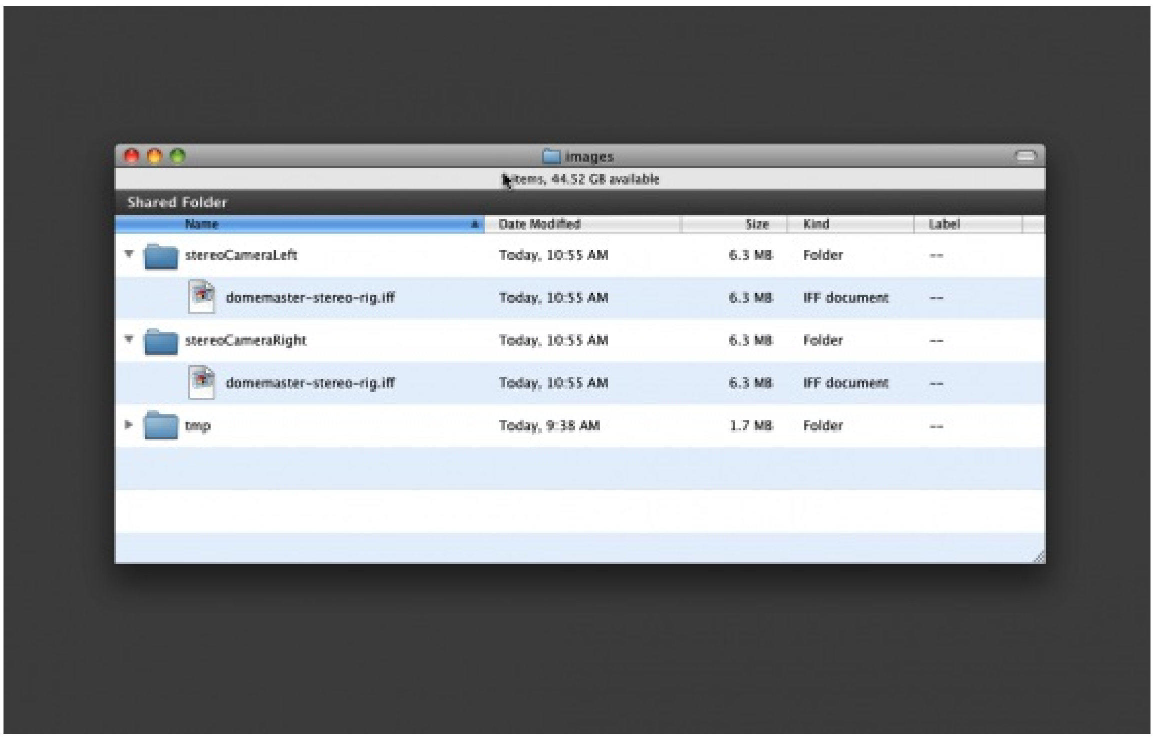


In the mental ray Batch Render Options window click the **batch render and close** button.

When the batch render completes, switch to your desktop and open the images directory for your current Maya project.

Maya automatically created folders called stereoCameraLeft and stereoCameraRight.

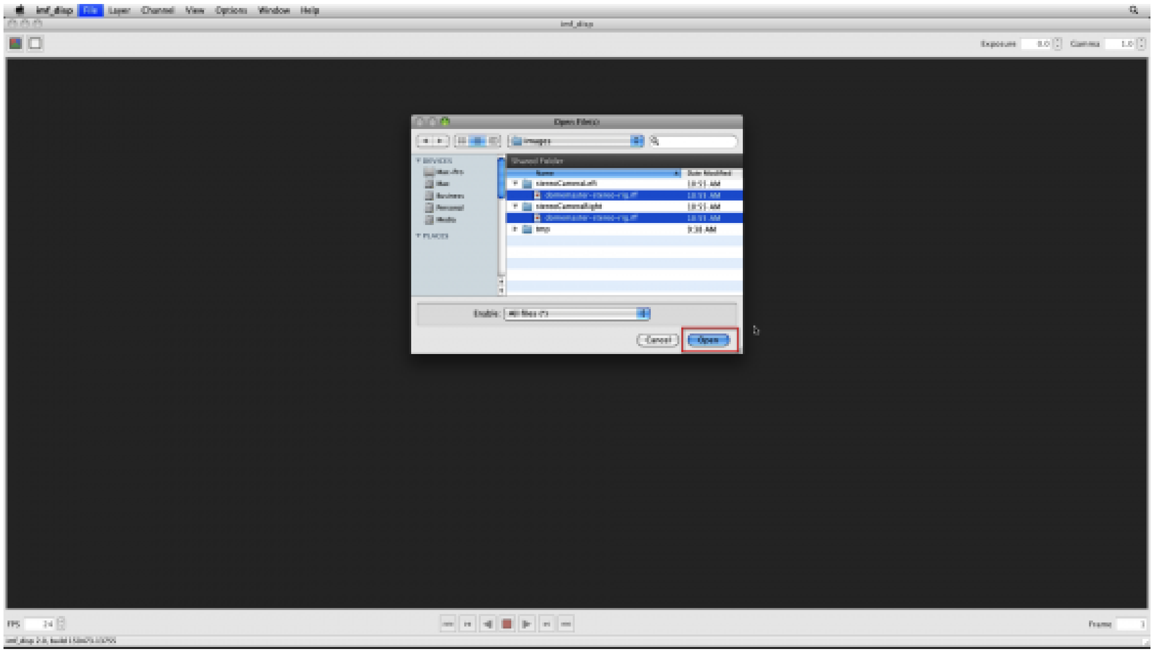




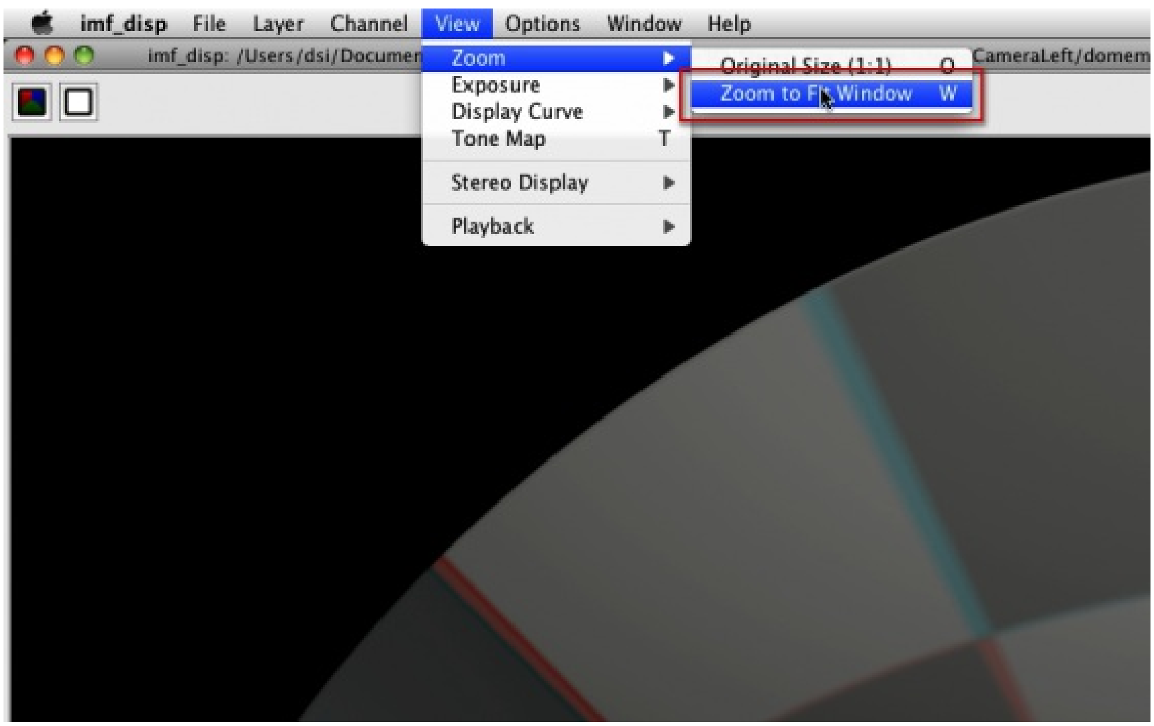
Viewing the renderings using imf_disp

You can use the mental ray image viewer imf_disp that comes with Maya to view the stereo renderings.

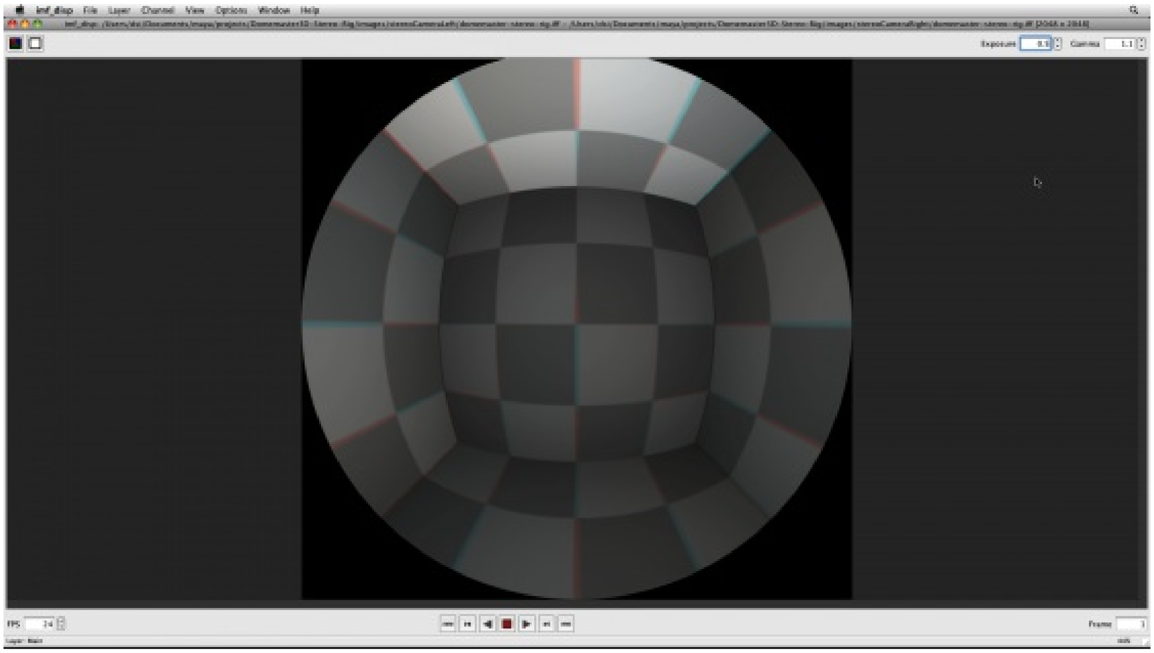
Open imf_disp program that is located in the Maya / mental ray / bin folder. From the **File** menu select **Open Stereo...**



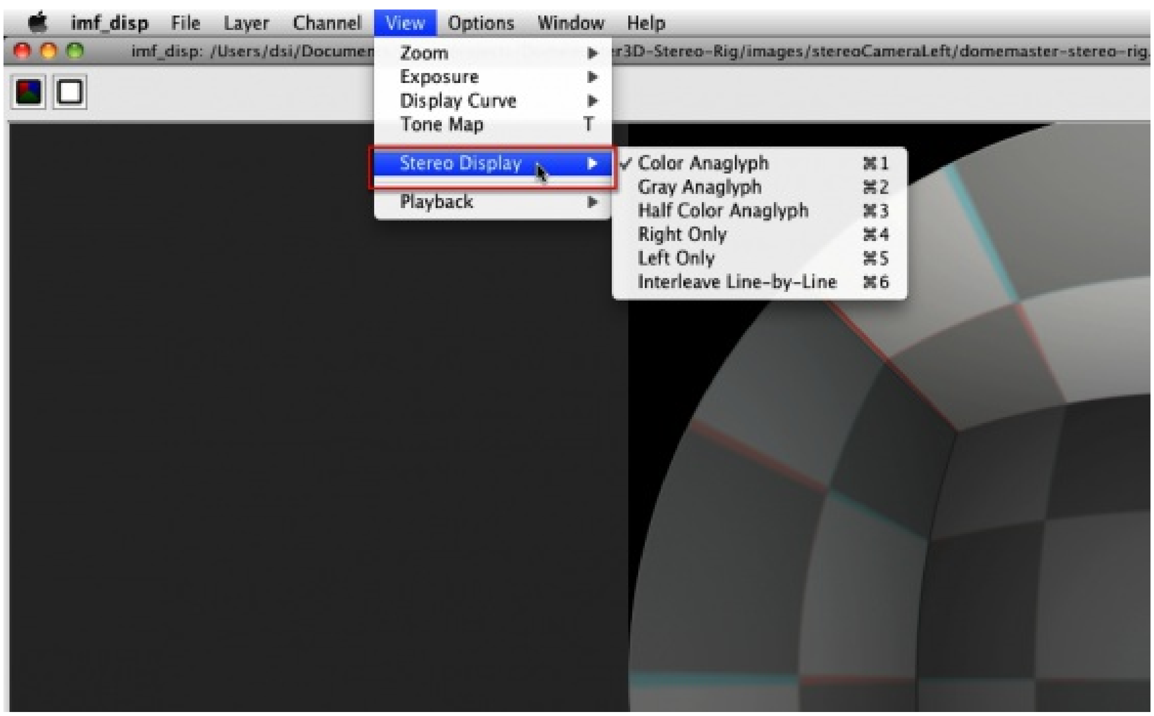
In the open dialogue select the two stereo images. You can fit the stereo images to your screen by selecting the **View > Zoom > Zoom to Fit Window** menu item or by pressing the **W** key on your keyboard.



The imf_display program has an exposure and gamma control you can use to adjust the brightness of the image.



You can change the stereo display mode by selecting the **View > Stereo Display** menu item.



Conclusions

Congratulations for making it through this tutorial! There was a lot of stuff to cover but you have now rendered your first stereoscopic Domemaster image. We have gone over the steps required to make all the connections for a Domemaster3D shading network and how to create a fulldome stereo camera rig.